

ENVIRONMENTAL ASSESSMENT
FOR THE
MANAGEMENT OF SNOWMOBILES
IN
ROCKY MOUNTAIN NATIONAL PARK

Prepared by:

U.S. Department of the Interior

National Park Service

Rocky Mountain National Park

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List of Abbreviations

ATV	All Terrain Vehicle
BLM	Bureau of Land Management
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CNHP	Colorado Natural Heritage Program
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FWS	U.S. Fish and Wildlife Service
NEPA	National Environmental Policy Act
NPS	National Park Service
NRCS	Natural Resources Conservation Service, U.S. Department of Agriculture
OHV	Off-Highway Vehicle
RMNP	Rocky Mountain National Park
USFS	United States Forest Service

U.S. DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

ENVIRONMENTAL ASSESSMENT

FOR THE

MANAGEMENT OF SNOWMOBILES

IN

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Executive Summary

This EA evaluates four possible alternatives related to the future use of snowmobiles in Rocky Mountain National Park (RMNP), and examines the potential impacts that could result from each of the alternatives.

The level of snowmobile use in RMNP is among the highest throughout the National Park System. During the winter of 1999/2000 28,417 snowmobiles entered the park and in 2000-2001 24,773. There are only two snowmobile routes currently in use in the park. The first is about 2 mi. (3.2 km) in length and passes through a section of the park near the town of Grand Lake. The second is 16 mi. (25.6 km) in length and follows Trail Ridge Road from the vicinity of the Kawuneeche Visitor Center to Milner Pass. The park previously examined snowmobile use in an environmental assessment (EA) completed in 1980.

On April 26, 2000, the Department of the Interior Assistant Secretary for Fish and Wildlife and Parks directed the National Park Service (NPS) to take a fresh look at snowmobile use and determine whether that use is consistent with the service-wide regulation found in 36 CFR 2.18 (promulgated in 1974), as well as the Executive Orders 11644 (promulgated in 1972) and 11989 (promulgated in 1977). The regulation and the executive orders prohibit snowmobiles except when their use is consistent with the park's natural, cultural, scenic and aesthetic values, safety considerations, park management objectives, and will not disturb wildlife or damage park resources. Where snowmobiles

are permitted, they must travel on designated routes and frozen water surfaces that are used during other seasons by motor vehicles and motorboats.

The Assistant Secretary's memorandum does not apply to units of the National Park System in Alaska and at Voyageurs National Park in Minnesota because their enabling legislation contains provisions regarding snowmobile use. Additionally, the memorandum does not apply to Yellowstone and Grand Teton national parks and the John D. Rockefeller Memorial Parkway while they are involved in an on-going winter use planning process. The Yellowstone National Park Winter Use Plan and Environmental Impact Statement (EIS) has been released for public review, and the NPS preferred alternative is to phase out snowmobile use in Yellowstone National Park by the winter of 2003-2004.

The Assistant Secretary's memorandum also provided that parks could consider authorizing snowmobile use where it was deemed necessary or essential to provide access to inholdings within a park, or where crossing park land provided the only means of practicable access to nearby private or public land.

NPS managers must comply with all provisions of law when authorizing snowmobile activities within areas of the National Park System (NPS Director's Order #55 - Interpreting the National Park Service Organic Act). The most fundamental of those provisions are found in the NPS Organic Act of 1916 (16 USC §1) and the Redwood Act amendment to the 1970 NPS General Authorities Act (16 USC §1a-1). The "fundamental purpose" of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act as amended, begins with a mandate to conserve park resources and values. This mandate is independent of the separate prohibition of impairment, and so applies all the time with respect to all park resources and values, even when there is no risk that any park resources or values may be impaired.

There has been a growing concern among environmental groups and some members of Congress regarding the appropriateness of recreational snowmobiling in national parks. This concern has been triggered in part by the winter use planning effort currently underway for Yellowstone and Grand Teton National Parks, which has focused on the adverse environmental effects caused by heavy snowmobile activity in those parks.

National park superintendents are expected to vigorously apply existing Executive Orders and NPS national regulatory standards and to assess whether past snowmobile activity would be consistent with any of the narrow exceptions in 36 CFR 2.18 or recently identified exceptions in the April 26, 2000 memorandum from the Department of the Interior Assistant Secretary for Fish and Wildlife and Parks. Park superintendents are also expected to determine if snowmobile activities are impairing park resources and values. Unless the standards can be met, an exception is found to apply, and impairment is not occurring, such activity will be terminated within that particular park.

In the past there have been four authorized snowmobile routes within RMNP:

- North Supply Access Trail (2 mi./3.2 km in length)
- Trail Ridge Road from the Sun Valley Road to Milner Pass (16 mi./25.6 km in length)

- Summerland Park Snowmobile Trail (1.1 mi./1.8 km in length)
- Bowen Gulch Access Route (0.6 mi./1 km in length)

Snowmobile use is no longer permitted on the Summerland Park Snowmobile Trail or the Bowen Gulch Access Route.

The April 26, 2000 memorandum identified some narrow exceptions not identified in 36 CFR 2.18. The North Supply Access Trail is the only route that meets one of the exceptions and was specifically mentioned in the April 26, 2000 memorandum. Trail Ridge Road does not provide access to other routes outside the park and is used strictly for recreational purposes. The April 26, 2000, memorandum states that the exceptions are not automatic, and each park must base their decision regarding the use of snowmobiles on an analysis of impacts to park resources and on the executive orders and service-wide regulations.

This Environmental Assessment explores four alternatives as follows:

Alternative 1 (Preferred Alternative) – The North Supply Access Trail would remain open to snowmobiles to provide access to USFS lands west of the park. Trail Ridge Road would be permanently closed to snowmobiles. The Summerland Park Snowmobile Trail and Bowen Gulch Access Route would remain closed to snowmobiles. Trail Ridge Road from the park boundary to the Timber Lake Trailhead parking lot would remain open to automobiles. The portion of Trail Ridge Road open to automobiles would be maintained most of the time with about 3 in. (8 cm) of packed snow to accommodate automobile traffic but minimize safety concerns and environmental impacts. 36 CFR §7.7(e) would be amended to permanently close Trail Ridge Road, the Bowen Gulch Access Route and the Summerland Park Snowmobile Trail.

Alternative 2 (No Action) – The North Supply Access Trail and Trail Ridge Road from the Kawuneeche Visitor Center to Milner Pass would remain open to snowmobiles. Snowmobile access to Trail Ridge Road from the North Supply Access Trail would follow Sun Valley Road to the Kawuneeche Visitor Center. Trail Ridge Road would be maintained as in the past from the Kawuneeche Visitor Center to the Timber Creek Trailhead parking lot. This portion of Trail Ridge Road would serve as a dual use road for snowmobiles and automobiles and would be maintained with 3 in. (8 cm) of packed snow. The Summerland Park Snowmobile Trail and Bowen Gulch Access Route would remain closed and 36 CFR §7.7(e) would be changed to permanently close these two trails.

Alternative 3 (Less Restrictive) -- The North Supply Access Trail and Trail Ridge Road from the Kawuneeche Visitor Center to Milner Pass would remain open to snowmobiles. Snowmobile access to Trail Ridge Road from the North Supply Access Trail would follow Sun Valley Road to the Kawuneeche Visitor Center. Trail Ridge Road would be maintained as in the past from the Kawuneeche Visitor Center to the Timber Creek Trailhead parking lot. This portion of Trail Ridge Road would serve as a dual use road for snowmobiles and automobiles and maintained with 3 in. (8 cm) of packed snow. The Summerland Park Snowmobile Trail and Bowen Gulch Access Route would be reopened. The current wording in 36 CFR §7.7(e) would remain and the superintendent's compendium would be changed allowing snowmobiles on these two trails.

Alternative 4 (Most Restrictive) – RMNP would be closed to all snowmobiles. The North Supply Access Trail, Trail Ridge Road, Summerland Park Snowmobile Trail and Bowen Gulch Access Route would be permanently closed to snowmobiles. The portion of Trail Ridge Road from the park boundary to the Timber Lake Trailhead would be open to automobiles and maintained with 3 in. (8 cm) of packed snow to accommodate automobile traffic but minimize safety concerns and environmental impacts.

Regardless which alternative is selected, RMNP would continue to use snowmobiles within the park for administrative purposes. NPS administrative use of snowmobiles will be restricted to that required to manage public use of snowmobile routes and areas where and if authorized, to conduct emergency operations, and to accomplish essential maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means. Implementing the preferred alternative will closed Trail Ridge Road between the Timber Lake Trail Head parking lot and Milner Pass to snowmobiles. If for any reason the park decides to use a snowmobile beyond the Timber Lake Trailhead parking lot, a minimum requirement analysis will be required as addressed in the 2001 Backcountry/Wilderness Management Plan.

In this EA, all issues and concerns have been considered and the most significant of these have been analyzed in detail. The potential effects of each alternative on natural and cultural resources, visitor use, local and regional economies and the park's environmental integrity are fully explored.

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Section 1. PURPOSE AND NEED

This EA evaluates four possible alternatives that address the future of snowmobile use in RMNP. This EA examines the potential impacts that could result from each of the alternatives. The objectives of the management and conservation actions outlined in this EA are to (1) meet NPS regulations, policies and guidelines, (2) minimize the effect that snowmobiles may be having on the natural and cultural environment, and (3) to minimize the impacts of human activities on wildlife and their habitat.

The level of snowmobile use in RMNP is among the highest in the NPS. Snowmobiles are presently permitted in the Colorado River District of RMNP on two routes - the North Supply Access Trail and Trail Ridge Road (Figure 1, page 9). The remainder of the park is closed to snowmobiles.

The current scrutiny of recreational snowmobile use in units of the National Park System was prompted by an April 26, 2000, memorandum prepared by the Department of the Interior Assistant Secretary for Fish and Wildlife and Parks. The Assistant Secretary announced a renewed commitment by the NPS to enforce existing NPS national standards regarding snowmobile use within the National Park System. These national standards can be found in the Code of Federal Regulations (36 CFR 2.18) and in Executive Orders 11644 and 11989. Under this renewed regulatory enforcement effort, superintendents at parks that previously allowed snowmobiles are now expected to vigorously apply the existing Executive Orders and regulatory standards, and to assess whether continued snowmobile activity would be consistent with any of the narrow exceptions identified by 36 CFR 2.18, or by the April 26, 2000, memorandum. Their use must be consistent with the park's natural, cultural, scenic and aesthetic values, safety considerations, park management objectives, and not disturb wildlife or damage park resources. Unless the standards can be met, or an exception is authorized, and no impairment is occurring to park resources, snowmobile activity will be terminated.

The renewed enforcement effort on snowmobiling was prompted by a rulemaking petition that the Department of the Interior received in 1999 from the Bluewater Network, the leader of a coalition of over 60 organizations working to prohibit snowmobiling throughout the National Park System. The rulemaking petition requested that the NPS ban snowmobiling in all units of the National Park System. In responding to the Bluewater petition, the NPS first sent a questionnaire to the 42 units of the National Park System that currently allow recreational snowmobiling. The survey was designed to assess the extent to which affected units of the system had complied with existing park service regulations and past Executive Orders regulating snowmobile use. The result of the survey indicated that the NPS was not fully complying with NPS regulations and executive orders (April 27, 2000, Office of the Assistant Secretary, Department of the Interior press release).

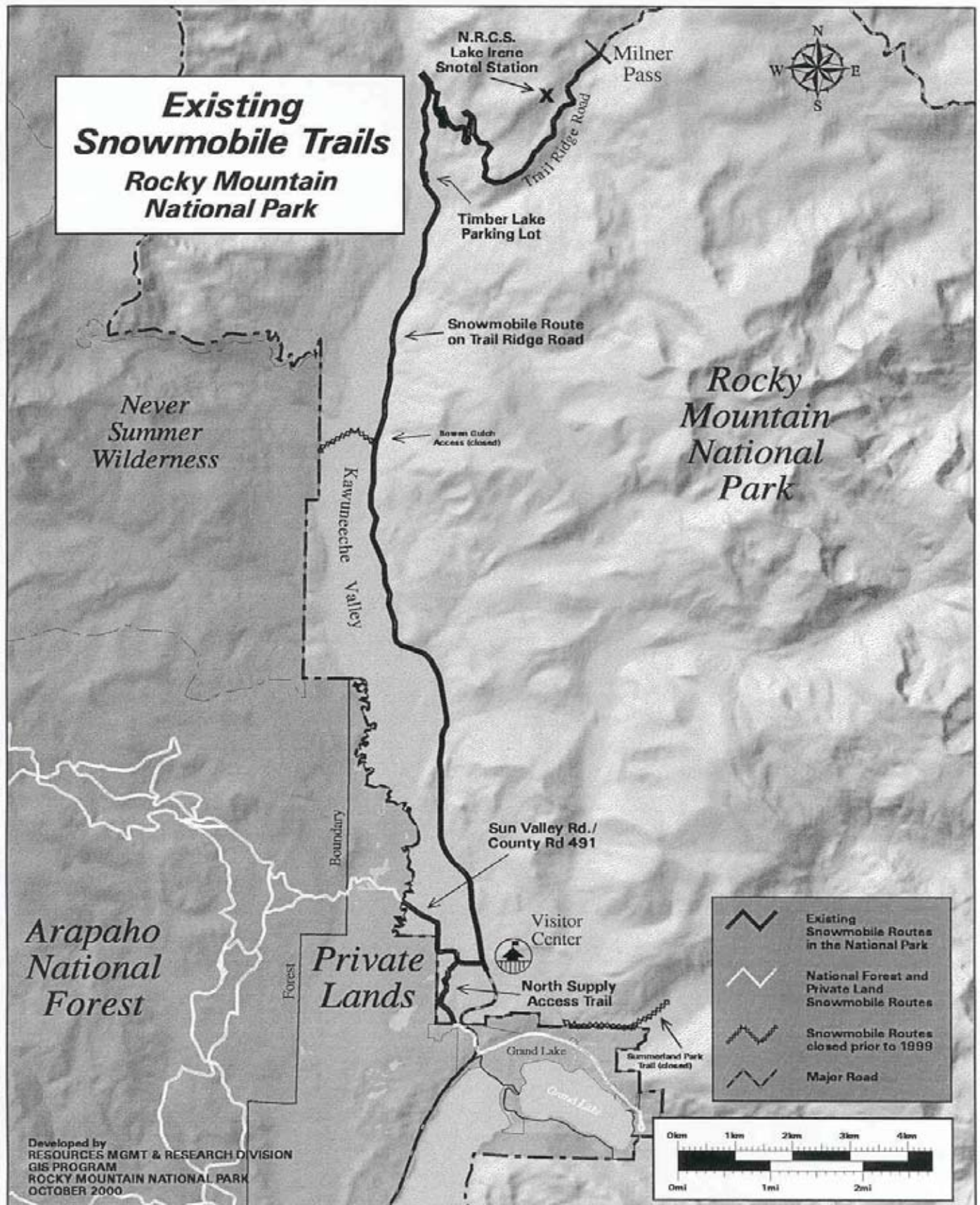


Figure 1

1.1 Background

The Assistant Secretary's memorandum does not apply to units of the National Park System in Alaska and at Voyageurs National Park in Minnesota because their enabling legislation contains provisions regarding snowmobile use. Additionally, the memorandum does not apply to Yellowstone and Grand Teton national parks and the John D. Rockefeller Memorial Parkway while they are involved in an on-going winter use planning process. The Yellowstone National Park Winter Use Plan and Environmental Impact Statement (EIS) has been released for public review, and the NPS preferred alternative is to phase out snowmobile use in Yellowstone National Park by the winter of 2003-2004.

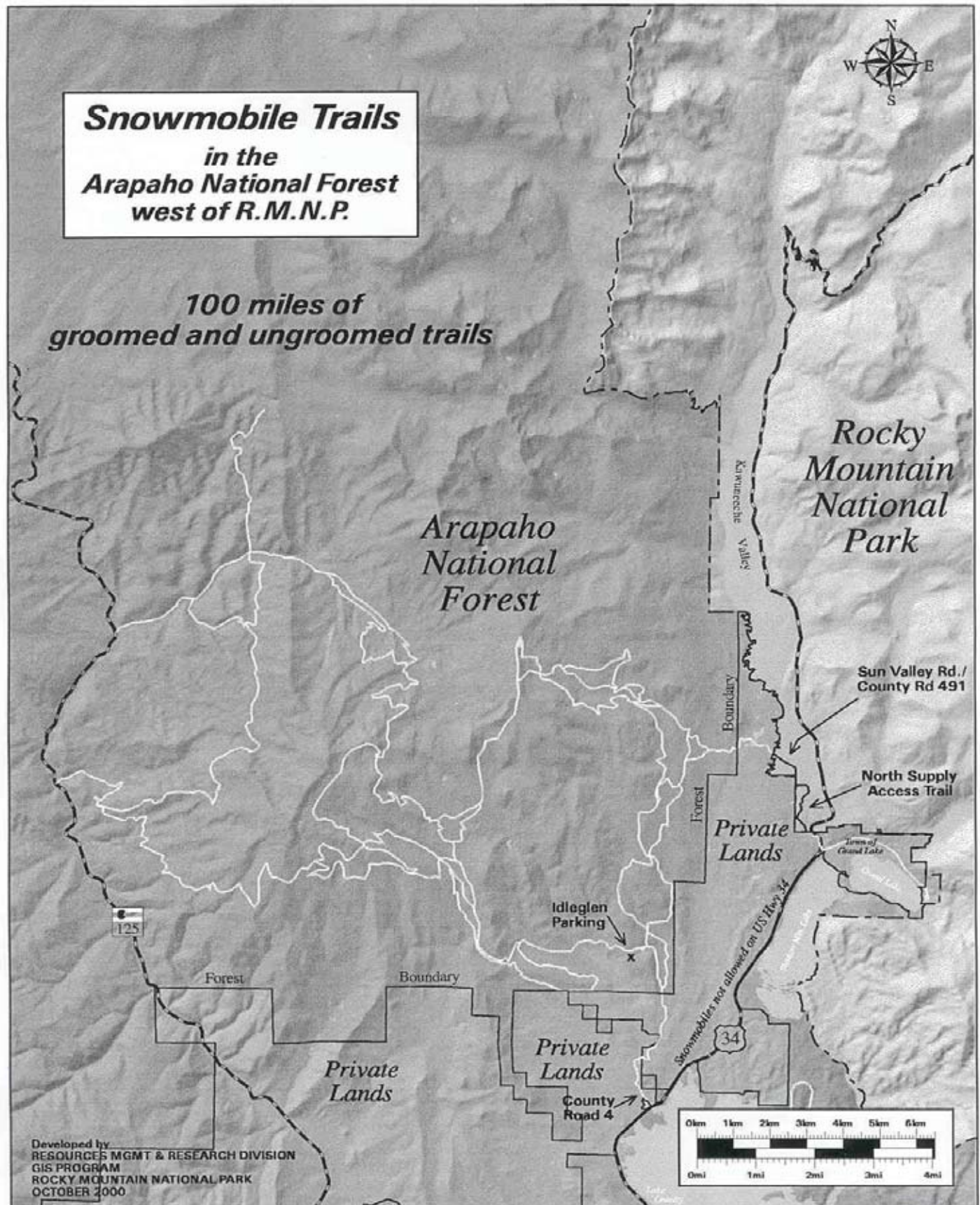
The Assistant Secretary's April 26, 2000, memorandum also provided that parks could consider authorizing snowmobile use where it was deemed necessary or essential to provide access to inholdings within a park, or where crossing park land provided the only means of practicable access to nearby private or public land. These exceptions do not apply to private lands that are adjacent to RMNP because other means of access are available. Nor do these exceptions apply to inholdings within RMNP that are along Trail Ridge Road and Sun Valley Road because these roads are open to automobiles during the winter. There are two private inholdings along the North Inlet Trail to Summerland Park. Allowing the landowners to access their inholdings by snowmobiles is allowed and will be handled administratively. Access to Summerland Park by snowmobiles for the general public has not been allowed since 1997 partly due to snowmobile users illegally driving onto the private inholdings.

The exception that allows access to nearby public land is pertinent to RMNP, and the park was specifically mentioned in the April 26, 2000, memorandum. The North Supply Access Trail through RMNP currently provides the only safe and reasonable means of access between the town of Grand Lake and public lands west of the park that are managed by the United States Forest Service (USFS) where snowmobile use is allowed (Figure 2, page 11). The North Supply Access Trail where it passes through the park is approximately 2 mi. (3.2 km) in length and provides access to 17 named snowmobile routes that cover 92.3 mi. (147.9 km) of trails west of the park on USFS land. This network of trails is called the Stillwater Trail Off-Highway Vehicle (OHV) system (Bill Dunkelberger, personal communication). The 16 mi. (25.6 km) portion of Trail Ridge Road within RMNP presently open to snowmobiles does not meet the stated exceptions and is only used for recreational purposes.

Even though the Assistant Secretary's memorandum included exceptions that allow for snowmobile access to nearby public land, those exceptions are not automatic. Therefore, this environmental analysis considers whether to continue such use based on the standards of the Executive Orders and service-wide regulations.

There are two other possible means of access to the USFS Stillwater Trail OHV System that are open to snowmobiles (Figure 2, page 11):

1. Trailer snowmobiles to the USFS Idleglen parking area 6 mi. (9.6 km) south of Grand Lake off of U.S. Highway 34.



2. Drive a snowmobile down Shadow Mountain Lake, cross Green Ridge and continue along Highway 34 to County Road 4, cross Highway 34 and then travel 2 to 3 mi. (3.2 - 4.8 km) along County Road 4 to the USFS Idleglen parking area.

Trailing or driving a snowmobile from Grand Lake to the Idleglen parking raises concerns about safety, securing access across private land, and lack of capacity at the Idleglen parking lot. Currently rental companies cannot trailer snowmobiles to or stage snowmobiles from the Idleglen Trailhead Parking area. This activity would require a commercial outfitter/guide special use permit. Idleglen Trailhead is currently filled to capacity during peak use periods with non-commercial users. To accommodate any commercial use from Idleglen Trailhead, additional parking capacity would need to be built, as well as a determination of total user capacity in the entire trail system. Presently, the USFS believes that the off-site commercial snowmobile rentals that access the Stillwater Trail system via the North Supply Access Trail vs. the on-site non-commercial public parking at Idleglen Trailhead that provide access to the trail system is an adequate mix of accommodation, spreads out the use, and thus a prospectus to allocate commercial use of the facility is not planned in the near future. These concerns are discussed in further detail in Section 3.1.1 (page 26) of this EA.

1.1.1 History of Snowmobile Use in RMNP

There is anecdotal evidence of snowmobile use in the Colorado River District of RMNP from the early 1960's, but the first snowmobile use statistics were not recorded until 1967 when 88 snowmobiles entered the park. Snowmobile use has increased significantly since the 1960's. During the winter of 1999/2000, a total of 28,417 snowmobiles entered the park. Table 1 provides snowmobile use statistics for RMNP since the winter of 1995/1996. On average, 85% of snowmobiles that entered RMNP during those years used the North Supply Access Trail and 15% used Trail Ridge Road.

Table 1. RMNP Snowmobile Use Statistics – Colorado River District

Winter	North Supply Access Trail	Trail Ridge Road	Total
1999/2000			
December 99	5888	1172	7060
January 00	7565	1176	8741
February 00	8292	1235	4163
March 00	2876	213	3089
	24,621 (87%)	3796 (13%)	28,417
1998/1999			
December 98	4974	1013	5987
January 99	5798	1242	7040
February 99	9349	1206	10555
March 99	2263	1442	3705
	22,384 (82%)	4903 (18%)	27,287
1997/1998			

Winter	North Supply Access Trail	Trail Ridge Road	Total
December 97	8510	1142	9652
January 98	10179	1276	11455
February 98	8947	1217	10164
March 98	3946	1191	5137
	31,582 (87%)	4826 (13%)	36,408
1996/1997			
December 96	7790	1071	8861
January 97	7013	902	7915
February 97	6366	991	7357
March 97	2120	1377	3497
	23,289 (84%)	4341 (16%)	27,630
1995/1996			
December 95	3529	634	4163
January 96	7621	766	8387
February 96	4268	1204	5472
March 96	3709	1027	4736
	19,127 (84%)	3631 (16%)	22,758

According to interviews with former park employees, snowmobiles were originally allowed to travel on Trail Ridge Road to Fall River Pass where the Alpine Visitor Center is located (elevation 11,795 ft./3,595 m). In 1972, former Superintendent Roger Contor seriously considered discontinuing snowmobile use in the park except for the North Supply Access Trail, because of the following:

1. A growing number of off-road violations
2. Availability of unlimited snowmobile use on the adjacent Arapaho National Forest and on the Shadow Mountain Recreation Area, which was managed by the NPS at the time (the Shadow Mountain Recreation Area is now known as the Arapaho National Recreation Area and is managed by the USFS).
3. A lack of sufficient park personnel to patrol and enforce regulations.

Superintendent Contor based his decision on the 1972 Executive Order 11644 (37 FR 2877), later amended by Executive Order 11989 (promulgated in 1977), which imposed restraints on off-road vehicle uses on Federal lands, including snowmobiles. In 1973 superintendent Contor reauthorized four snowmobile routes in the park (Figure 2, page 11):

1. Across the southwest corner of the park from Grand Lake to Supply Creek, which is now commonly called the North Supply Access Trail.
2. A route to Summerland Park.
3. The use of Trail Ridge Road from the park boundary to Milner Pass.
4. The Bowen Gulch Access Route.

In response to Executive Orders 11644 and 11989, Roger Contor participated in public meetings at Grand Lake, Colorado, on October 24, 1973, and February 28, 1974, to discuss routes and areas of proposed snowmobile use on park land in Grand County, including the former Shadow Mountain Recreation Area. He

agreed to leave the four snowmobile routes open and publish a notice in the Federal Register. The initial Federal Register notice was published on February 14, 1975.

The NPS promulgated the regulation contained in 36 CFR 2.18 on April 1, 1974, which had the effect of closing all NPS lands to snowmobiling except those specifically designated as open through publication of notice in the Federal Register by each national park area. On April 21, 1975, a meeting attended by the superintendent, the Grand County Commissioners, Grand Lake Chamber of Commerce directors, and snowmobile club officers was held to hear proposals to open new routes in addition to those proposed in the Federal Register notice of February 14, 1975. No other routes were authorized and the final notice authorizing the use of certain trails was published in the Federal Register on January 13, 1976. On October 11, 1978, P.L. 95-450 established the Arapaho National Recreation Area, turning the former Shadow Mountain Recreation Area over to the USFS.

In the Committee Report (H.R. 95-1460) accompanying P.L. 95-450, Congress asked the NPS to address the possibility of a snowmobile route within RMNP along the east shore of Shadow Mountain Lake to connect with the Arapaho National Recreation Area. Congress also asked the NPS to consider extending the Trail Ridge Road snowmobile route from Milner Pass to the Alpine Visitor Center. A "Notice of Revised Snowmobile Policy" was published in the Federal Register (44 FR 157) on August 13, 1979. Superintendent Charles Brooks decided to do an EA to address environmental impacts from all of the proposed trails, including those already in use and those requested by Congress. The EA was completed in 1980 and addressed six snowmobile routes:

- Summerland Park Snowmobile Trail (existing)
- North Supply Access Trail (existing)
- Trail Ridge Road from Sun Valley Road to Milner Pass (existing)
- Bowen Gulch Access Route (existing)
- East Shore Access Route (new)
- Trail Ridge Road Extension from Milner Pass to the Alpine Visitor Center (new)

A Finding Of No Significant Impact (FONSI) was signed in 1981. With the signing of the FONSI, approval was granted for snowmobile use of the Summerland Park Snowmobile Trail, North Supply Access Trail, Trail Ridge Road to Milner Pass, and Bowen Gulch Access Route. The East Shore Access Route was not approved for snowmobile use because of potential environmental impacts to bald eagles in an area that is critical bald eagle habitat. Extending snowmobile use of Trail Ridge Road from Milner Pass to the Alpine Visitor Center was also not approved because of potential impacts to sensitive alpine tundra and public safety concerns. In both cases, the NPS elected to take the "No Action" alternative and did not open them to snowmobiles.

In 1981, the Bowen Gulch Access Route was closed shortly after Congress designated the Bowen and Baker Gulch areas adjacent to the park as part of the Never Summer Wilderness, thus closing these USFS lands to all forms of mechanical vehicles including snowmobiles. Designating the wilderness area eliminated the need for the access trail for snowmobiles across NPS land. The Summerland Park Snowmobile Trail was closed to snowmobiles in 1997 because of inaccessibility (which made the area difficult for park rangers to patrol), off-road violations, and incidents of trespass onto adjacent private lands. 36 CFR §7.7(e) still designates the Bowen Gulch Access Route and the Summerland Park Snowmobile Trail as snowmobile routes. However, the park lists in its compendium in 36 CFR that these two routes are closed to snowmobiles pending changes to 36 CFR §7.7(e). This EA evaluates whether these two routes should be closed permanently.

At the present time there are only two authorized snowmobile routes in RMNP, the North Supply Access Trail and Trail Ridge Road from Sun Valley Road to Milner Pass.

If after careful review of public comments, resource, economic and visitor impacts, and the preferred alternative (Alternative 1) is selected for promulgation. It will become a special regulation in the Code of Federal Regulations (Title 36, §1.7(b), Section §7.7(e)) and only one snowmobile trail would remain open.

- The North Supply Access Trail

Note: The three previously designated snowmobile trails (routes) will no longer be authorized. Trail Ridge Road would no longer be authorized. Six miles of Trail Ridge Road east of the Timber Lake Trailhead parking lot to Milner Pass would revert to a Backcountry Trail during the winter months when it is closed to all mechanized vehicles. The Summerland Park Snowmobile Trail would no longer be authorized. Access for the two inholders in the area will be handled administratively. The Bowen Gulch Access Trail will no longer be authorized due to USFS wilderness designation adjacent to the park's western boundary.

These changes would be consistent with pending revision of the park's Special Regulations under 36 CFR §7.7.

The only designated snowmobile route open for dual use by both motor vehicles and snowmobiles would include:

Sun Valley Road

Trail Ridge Road would no longer be a dual use road and would be closed to snowmobiles, but opened to automobiles from the park boundary to the Timber Lake Trailhead parking lot during the winter months.

1.2 RELATIONSHIP TO EXISTING LAWS, PLANS, POLICIES AUTHORITIES AND GUIDELINES

Rocky Mountain National Park Act of 1915

Congress established RMNP on January 26, 1915. The park's enabling legislation states, "...said area is dedicated and set apart as a public park for the benefit and enjoyment of people of the United States...with regulations being primarily aimed at the freest use of the said park for recreation purposes by the public and for the preservation of the natural conditions and scenic beauties..." (38 Stat. 798). The significance of RMNP lies in displaying, preserving and making available for public use and enjoyment, some of the finest examples of the spectacular physiographic, biologic, and scenic features typifying the southern Rocky Mountains. These natural and historic resources are even more significant because of their proximity to Colorado's Front Range metropolitan areas. Minimizing impacts to the natural environment, but yet still providing recreational opportunities for the public is consistent with the park's enabling legislation.

The National Park Service Organic Act of 1916

Congress formally established the NPS by the Act of August 25, 1916, commonly called the Organic Act. The key management-related provision of the Organic Act is:

The National Park Service shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified ... by such means and measures as conform to the fundamental purpose of the said parks, monuments, and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations (16 USC §1).

The Redwood Act of 1978

Congress supplemented and clarified the 1916 Organic Act through enactment of the General Authorities Act in 1970, including amendments to the latter law enacted in 1978 (the "Redwood amendment," contained in a bill expanding Redwood National Park). The key part of that Act, as amended, is:

Congress declares that the National Park System, which began with establishment of Yellowstone National Park in 1872, has since grown to include superlative natural, historic, and recreation areas in every major region of the United States, its territories and island possessions; that these areas, though distinct in character, are united through their inter-related purposes and resources into one National Park System as cumulative expressions of a single national heritage; that, individually and

collectively, these areas derive increased national dignity and recognition of their superlative environmental quality through their inclusion jointly with each other in one National Park System preserved and managed for the benefit and inspiration of all the people of the United States; and that it is the purpose of this Act to include all such areas in the System and to clarify the authorities applicable to the system. Congress further reaffirms, declares, and directs that the promotion and regulation of the various areas of the National Park System, as defined in section 1c of this title, shall be consistent with and founded in the purpose established by section 1 of this title [*the 1916 NPS Organic Act*], to the common benefit of all the people of the United States. The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress (16 USC §1a-1).

The Endangered Species Act

The Endangered Species Act (ESA) requires the NPS to determine whether a proposed action would affect federally listed threatened or endangered species. It is well within the spirit of the act that the NPS also protects candidate species to prevent listing of a particular species in the future.

The purpose of the ESA is “to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, and to provide a program for the conservation of endangered, and threatened species ...” It is important to note that despite the management decisions that are made as a result of this EA, more restrictive measures may have to be taken in the future to comply with the ESA. For example, more restrictions could be imposed on snowmobiles if they are found at a later date to be having a detrimental impact on a federally listed species such as the lynx (see Section 3.1.5 on page 37).

Wilderness Act of 1964

The 1964 Wilderness Act established a National Wilderness Preservation System composed of designated federally owned areas and provided a process for identifying potential wilderness. The Act requires that federal agencies administer these areas for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for protection and preservation of their wilderness character. The Act concurs with and generally reinforces the resource protection mandate of the NPS Organic Act.

Reference Manual and Director's Order #41 (1999) provides further guidance for wilderness preservation and management. Most of RMNP (93%) is recommended and potential additions to wilderness. These areas are to be managed as wilderness until Congress decides whether or not to confer wilderness status. About two percent of RMNP is designated wilderness.

Clean Air Act

The Clean Air Act (CAA) requires the NPS to meet all federal, state, and local requirements. In most cases, the authority for implementing and enforcing requirements rests with state and local authorities.

The parts of this act relevant to snowmobile management are the Prevention of Significant Deterioration of Air Quality (PSD -- §§ 7470-7475) and Visibility Protection (§7479).

The PSD provisions establish a classification system for clean air areas of the United States. RMNP is designated as a Class I area. This classification indicates the additional increment of air quality degradation from particulate matter and sulfur dioxide (SO₂) that will be allowed in an area. Only a very small increment of new pollution is allowed in a Class I area and there is a need for federal land managers such as RMNP to "err on the side of [resource] protection." There are also National Ambient Air Quality Standards (NAAQS) for carbon monoxide and particulate matter that were developed to protect human health and the environment.

Visibility protection provisions require the NPS to estimate the visibility impacts resulting from emissions from pollution sources such as snowmobiles and to develop a strategy to control a source that may be responsible for causing significant visibility impairment.

National Environmental Policy Act

The major mandate of this Act is that federal agencies must consider the potential effects of their proposed actions on the environment. This mandate requires that the NPS and other federal agencies follow a systematic approach in assessing the environmental impacts associated with the proposed agency action. The National Environmental Policy Act (NEPA) is a tool for assuring that all federal agencies fully consider the environmental impacts of their actions, explore alternative courses of action, and identify steps to mitigate environmental damage.

The 1976 Master Plan for Rocky Mountain National Park

A Master Plan is the conceptual planning document that, consistent with congressional and administrative policies, establishes the guidelines for the overall use, preservation, management, and development of a park. This plan

recognizes humans, where present, as part of the park's ecosystem, but the major emphasis is on the perpetuation of natural processes. The 1976 Master Plan includes the following management objective:

“To restrict the use of oversnow vehicles to the west side of the park on unplowed roadways and other designated routes now in use.”

The snowmobile routes that were in use at the time the Master Plan was adopted in 1976 were:

1. Across the southwest corner of the park from Grand Lake to Supply Creek. This route is commonly called the North Supply Access Trail.
2. Summerland Park Snowmobile Trail.
3. The use of Trail Ridge Road from the Kawuneeche Visitor Center to Milner Pass; and
4. The Bowen Gulch Access Route.

As discussed on page 15, the Summerland Park Snowmobile Trail and Bowen Gulch Access Route have been closed to snowmobiles and this EA will evaluate whether those two routes should be closed permanently.

Executive Order 11644 amended by 11989

Executive Order 11644 - This executive order established policies and procedures to ensure that agencies control off-road vehicle use on public lands so as to protect the resources of those lands, to promote the safety of all users of those lands, and to minimize conflicts among the various users of those lands. The order requires agencies to designate areas and trails for off-road vehicle use. The designation of trails and areas must minimize damage to soil, watersheds, vegetation, or other resources of public lands; must minimize harassment of wildlife or significant disruption of wildlife habitats; and must minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, considering noise and other factors.

These use areas and trails can only be located in areas of the National Park System if the director determines that off-road vehicle use in such areas will not adversely affect their natural, aesthetic, or scenic values. Additionally, the director must monitor the effects of the use of off-road vehicles on lands in the National Park System and, on the basis of the information gathered, from time to time amend or rescind designation of areas to further the policy of this order.

Executive Order 11989 - This order requires that, whenever the director determines that the use of off-road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of a particular area or trail on public land, the park must immediately close such area or trail to the type of use causing such effects. The closure must remain until the director determines such adverse effects have been eliminated and that measures have been taken to prevent future recurrence.

36 CFR § 2.18 and 36 CFR § 7.7

To implement the directives of Executives Orders 11644 and 11989, the NPS promulgated a regulation covering recreational use of snowmobiles in all units of the National Park System. The regulation appears at 36 CFR §2.18. This regulation prohibits recreational snowmobile use except on designated routes and water surfaces that are used by motor vehicles or motor boats during other seasons. Parks must designate such routes on a case by case basis. Additionally, the regulation prohibits snowmobiles unless their use is consistent with the park's natural, cultural, scenic and aesthetic values, safety considerations, park management objectives, and will not disturb wildlife or damage park resources.

The specific regulation for snowmobile use in RMNP appears at 36 CFR § 7.7(e). That regulation designates the following trails: Summerland Park Snowmobile Trail; Supply Creek Access Snowmobile Trail (a.k.a. the North Supply Access Trail); the plowed portion of Trail ridge Road between the West Unit Visitor Center and the Timber Lake Trailhead; the unplowed portion of Trail Ridge Road between the Timber Lake Trailhead and Milner Pass; and the Bowen Gulch Access Route. The West Unit is now named the Colorado River District, and the West Unit Visitor Center is now called the Kawuneeche Visitor Center. As stated in Section 1.1 of this EA (beginning on page 9), the park lists in its compendium that the Summerland Park Snowmobile Trail and the Bowen Gulch Access Route are closed to snowmobiles pending changes to 36 CFR § 7.7(e). This EA will evaluate whether these two routes should be permanently closed to snowmobiles.

National Park Service Management Policies

Current NPS policy recognizes that snowmobile use is governed by Executive Order 11644 and amended by Executive Order 11989, "Use of Off-road Vehicles on Public Lands" (USC 4321), and in Alaska by provisions of ANILCA (16 USC 3121 and 3170). The policies prohibit the use of snowmobiles except on designated routes and frozen water surfaces that are used during other seasons by motor vehicles and motorboats. NPS administrative use of snowmobiles will be restricted to that required to manage public use of snowmobile routes and areas where and if authorized, to conduct emergency operations, and to accomplish essential maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means. The NPS will manage recreational activities and settings so as to protect park resources, provide for public enjoyment, promote public safety, and minimize conflicts with other visitor activities and park uses. The natural resources of the National Park System will be maintained, rehabilitated, and/or perpetuated. If humans are causing unnatural impacts, restoration of the environment by the NPS is allowed when needed to restore a native ecosystem function that has been disrupted by past or ongoing human activities. Routes and water surfaces may be designated for snowmobile use only in locations where there will be no significant adverse impacts on the park's natural, cultural, or scenic resources and values and in consideration of

other visitor uses. RMNP does not manage any body of water within its boundary that is open to motorboats or to snowmobiles.

Federal Water Pollution Control Act and Executive Order 11990 (Protection of Wetlands)

The Federal Water Pollution Control Act (Clean Water Act), and Executive Order 11990 (Protection of Wetlands) protect water and associated wetlands. The 1972 Clean Water Act, Section 404, provides indirect wetlands protection through a suite of nationwide water quality protection provisos designed to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." In 1977, Executive Order 11990 (Protection of Wetlands) ordered Federal agencies to "...avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practical alternative ..."

Memorandum of the Assistant Secretary for Fish and Wildlife and Parks

On April 26, 2000, the Assistant Secretary for Fish and Wildlife and Parks issued a memorandum to the Director of the National Park Service in response to a petition urging the NPS to ban snowmobiles in all units of the National Park System. The memorandum stated that a survey of units of the National Park System that allowed recreational snowmobile use disclosed that the units were out of compliance with both the executive orders and the service-wide regulation regarding recreational snowmobile use. The memorandum concluded that parks (except for parks in Alaska, Yellowstone, Grand Teton, and Voyageurs National Parks, and the John D. Rockefeller, Jr., Memorial Parkway) must repeal the regulations allowing snowmobile use except for three narrow exceptions.

- 1) Snowmobile use that transits across a park on a short designated route that is used in other seasons by motor vehicles and is necessary as the only practicable means of providing required or acceptable access to adjacent lands where snowmobile use is allowed. This exception specifically mentions RMNP.
- 2) Snowmobile use that is necessary to provide required winter access to private lands.
- 3) Snowmobile use that occurs entirely within the right-of-way of a state or county owned road that is routinely maintained by that entity of government.

The memorandum clarified that these are potential exceptions only. If snowmobile use falls within one of the exceptions and the park determines the use may continue, the park must develop and implement an appropriate monitoring program as required by Executive Order 11644.

RMNP reads this memorandum as requiring a fresh look at existing recreational snowmobile use to consider whether it meets or violates the standards set forth in the executive orders and regulation, as well as other applicable law.

NPS-77 Natural Resources Management Guidelines for Natural Soundscape and Noise

The NPS is responsible for “preserving the natural conditions and scenic beauties thereof” (38 Stat. 800). Human caused noise intrusions disrupt the experience sought by many park visitors, as well as wildlife that the NPS manages. The NPS will strive to preserve the natural quiet and natural sounds associated with the physical and biological resources of parks. Activities causing excessive or unnecessary unnatural sounds in and adjacent to parks will be monitored, and action will be taken to prevent or minimize unnatural sounds that adversely affect park resources or values or visitors' enjoyment of them.

Section 2. ALTERNATIVES CONSIDERED

This EA describes four alternatives. The preferred alternative is to permanently close Trail Ridge Road, Summerland Park Snowmobile Trail and Bowen Gulch Access Route to snowmobile use and leave open the North Supply Access Trail.

As previously mentioned in Section 1.1.1 (beginning on page 12), an EA on snowmobile use was completed in 1980. It addressed six snowmobile routes:

- Summerland Park Snowmobile Trail
- North Supply Access Trail
- Trail Ridge Road from the Kawuneeche Visitor Center to Milner Pass
- Bowen Gulch Access Route
- East Shore Access Route
- Trail Ridge Road Extension from Milner Pass to the Fall River Pass and the Alpine Visitor Center

With the signing of a Finding Of No Significant Impact (FONSI) in 1981, the Summerland Park Snowmobile Trail, North Supply Creek Access Trail, Trail Ridge Road to Milner Pass, and the Bowen Gulch Access Route remained open and were approved for snowmobile use at that time. The East Shore Access Route was not approved for snowmobile use because of potential environmental impacts to winter bald eagle habitat. Extended snowmobile use of Trail Ridge Road from Milner Pass to the Alpine Visitor Center was also not approved because of potential impacts to sensitive alpine tundra and public safety concerns. In both cases, the NPS elected to take the “No Action” alternative and did not open them to snowmobiles.

Those concerns are still valid in 2000 and those two routes are rejected from further consideration in this EA.

In 1981, the Bowen Gulch Access Route was closed shortly after the USFS designated the Bowen and Baker Gulch areas adjacent to the park as part of the Never Summer Wilderness. The Summerland Park Snowmobile Trail was closed to snowmobiles in 1997 because of inaccessibility, which made the area difficult for park rangers to patrol, off-road violations, and incidents of trespass onto adjacent private lands. Impacts related to wildlife, public safety, trespass, air quality, water quality and vegetation will be addressed in this document. This new EA addresses whether or not these two trails should remain permanently closed and whether or not Trail Ridge Road and the North Supply Access Trail should be permanently closed.

There are different reasons why the 1980 EA and 2000 EA were developed. The Committee Report (H.R. 95-1460) accompanying P.L. 95-450 in 1978 asked the NPS to address the possibility of a new snowmobile route, this request required an EA to evaluate snowmobile use in RMNP. In 2000, the Department of Interior Assistant Secretary for Fish and Wildlife and Parks directed the NPS to take a fresh look at snowmobile use and determine if snowmobile use is consistent with 36 CFR 2.18. This action also required an EA.

2.1 Alternative 1 – (Preferred)

To help protect natural and cultural resources within RMNP and to comply with laws, plans, policies and authorities, Trail Ridge Road and the Summerland Park Snowmobile Trail and Bowen Gulch Access Route will be permanently closed to snowmobiles. Language in 36 CFR §7.7(e) would be changed to reflect these closures. The North Supply Access Trail will remain open to provide snowmobile access to the USFS Stillwater Trail OHV System. Trail Ridge Road from the park boundary to the Timber Lake Trailhead parking lot will be maintained most of the time with three inches of packed snow to accommodate automobile traffic.

2.2 Alternative 2 – (No Action)

The North Supply Access Trail and Trail Ridge Road from the Kawuneeche Visitor Center to Milner Pass would remain open to snowmobile use. Snowmobile access to Trail Ridge Road from the North Supply Access Trail would follow Sun Valley Road to the Kawuneeche Visitor Center. As in the past, Trail Ridge Road from the park boundary to the Timber Lake Trailhead parking lot will be maintained most of the time with three inches of packed snow to accommodate automobile and snowmobile traffic. The Summerland Park Snowmobile Trail and the Bowen Gulch Access Route will remain closed and language in 36 CFR §7.7(e) would be changed to reflect the permanent closure of these two trails.

2.3 Alternative 3 -- (Less Restrictive)

The North Supply Access Trail and Trail Ridge Road from the Kawuneeche Visitor Center to Milner Pass would remain open to snowmobiles. Snowmobile access to Trail Ridge Road from the North Supply Access Trail would follow Sun Valley Road to the Kawuneeche Visitor Center. As in the past, Trail Ridge Road from the park boundary to the Timber Lake Trailhead parking lot will be maintained most of the time with three inches of packed snow to accommodate automobile and snowmobile traffic. The Summerland Park Snowmobile Trail and Bowen Gulch Access Route would be reopened. The current wording in 36 CFR §7.7(e) would remain and the compendium would be changed allowing snowmobiles on these two trails.

2.4 Alternative 4 – (Most Restrictive)

RMNP would be closed to all snowmobiles. The North Supply Access Trail, Trail Ridge Road, Summerland Park Snowmobile Trail and Bowen Gulch Access Route would be permanently closed to snowmobiles. Trail Ridge Road from the park boundary to the Timber Lake Trailhead parking lot would be maintained for automobiles with 3 in. of packed snow, to minimize environmental impacts. The purpose of this alternative is to apply the maximum restriction and reject the exception that allows snowmobile access to public land adjacent to the park. The regulation at 36 CFR §7.7(e) would be amended to reflect this change.

Regardless which alternative is selected, RMNP would continue to use snowmobiles within the park for administrative purposes. NPS administrative use of snowmobiles will be restricted to that required to manage public use of snowmobile routes and areas where and if authorized, to conduct emergency operations, and to accomplish essential

maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means. Lake Irene has a NRCS Snotel Site that may need to be accessed for emergency repairs on average once every five years. Replacement equipment is heavy and cumbersome and may require the use of a snowmobile. A minimum risk analysis as described in the Backcountry/Wilderness Management Plan, would be needed for any administrative use of a snowmobile east of the Timber Lake Trailhead parking lot to Lake Irene or beyond.

Section 3. AFFECTED ENVIRONMENT

The affected environment discussed in this EA focuses on the Colorado River District of RMNP during the winter, from November to the end of March.

3.1 NATURAL RESOURCES

3.1.1 Location and Access

RMNP encompasses 265,354 acres (107,430 hectares) and is located in the north central portion of Colorado. The Colorado River District is the largest district in the park encompassing about 128,360 ac. (51,940 ha.), which is about 48% of the park. The Colorado River District includes all park land west of the Continental Divide and all of the Cache La Poudre River drainage located west of the Mummy Range and Mummy Pass.

The park lies within Colorado's Larimer, Boulder, and Grand counties and the Colorado River District is located in Grand and Larimer counties. The town of Grand Lake is located along a portion of the Colorado River District's border. Land ownership along the entire park boundary is a mixture of state, local, private and federal land. About 62% of the park borders USFS land, with 70% of the USFS land managed as designated wilderness. The rest of the park borders subdivisions, summer camps, and municipalities such as Grand Lake.

During the winter months the east side of the park is easily accessible from the Denver metropolitan area, some 65 mi. (104 km) to the southeast. Interstates 25, 70 and 76, which converge in Denver, provide rapid access for visitors coming from all regions of the United States. Local highways that pass through the park include state highways 7, 34, and 36. Highway 34 is the main road through the park. However, during the winter it is closed to automobiles from Many Parks Curve on the east side of the Continental Divide to the Timber Lake Trailhead parking lot on the west side of the Continental Divide. During the winter, visitors access the Colorado River District from the Denver area by driving west on I-70 to Highway 40. Highway 40 crosses over the Continental Divide at Berthoud Pass and provides access to the Grand County communities of Winter Park, Fraser and Granby. From Granby, Highway 34 provides access to Grand Lake and the Colorado River District of RMNP.

Because of RMNP's popularity and its relatively easy access, visitation exceeds three million annually. About 17% of the yearly visitation enters the park through the Grand Lake Entrance located in the Colorado River District. For the past decade, visitation has been increasing at about two percent per year. Most of the visitation occurs between Memorial Day weekend and Labor Day weekend. Winter visitation drops off considerably in RMNP, and the Colorado River District has fewer visitors than the east side of the park. From December 1999 through March 2000, a total of 28,768 visitors entered the Grand Lake Entrance on Trail Ridge

Road. During this period 3,796 snowmobiles used Trail Ridge Road. It is estimated that less than 25 percent of the visitors who enter the Grand Lake Entrance during the winter are traveling by snowmobile. The remaining 75 percent are traveling by automobile and are visiting the park to sightsee, ski or snowshoe.

A total of 24,621 snowmobiles passed through the park on the North Supply Access Trail from December 1999 through March 2000. This number is not included in the visitor count at the Grand Lake Entrance since the destination is not the park but the USFS Stillwater Trail OHV System. No entrance fee is charged for snowmobile use on the North Supply Access Trail.

Snowmobile use in the park is largely dependent on weather. During the past five years snowmobile use has fluctuated from a low of 22,758 in 1995/1996 to a high of 36,408 in 1997/1998 (Table 1 on page 12). On average about 28,500 snowmobiles enter the park each winter and 85 % use the North Supply Access Trail. If Alternative 1 is adopted and Trail Ridge Road is closed to snowmobiles, it is anticipated that the use will shift to the North Supply Access Trail. The entire length of the North Supply access trail from the town of Grand Lake to USFS lands is about 2.5 mi. (4 km) with approximately 2 mi. (3.2 km) of it passing through the park (Figure 1, page 9). The first ½ mi. of the trail out of Grand Lake crosses some private properties.

Once the trail enters the park, the first 0.87 mi. (1.4 km) follows a utility corridor right-of-way that passes through a lodgepole pine forest. The right-of-way is maintained as an unpaved road. The utility corridor right-of-way is closed to public motorized travel during other times of the year, but is open to NPS administrative vehicles and utility vehicles that maintain buried sewer, phone, electrical, natural gas and cable TV lines. The utilities within the corridor provide service to private inholdings within the park, private properties outside the park as well as NPS housing and administrative buildings for the Colorado River District. In addition, this utility corridor is identified in the 1992 West Unit Seasonal Housing Development EA as a fire access road for a proposed new NPS seasonal housing area. The seasonal housing development is presently on hold due to a lack of funding, but the utility corridor right-of-way is still maintained as a fire access road. Sun Valley Road and Highway 34 are the two main roads that would be used by fire equipment, but under emergency situations the North Supply Access Trail would be an alternative road. The remaining 1.13 mi. (1.8 km) of the North Supply Access Trail that passes through the park follows Sun Valley Road.

About 15% of the snowmobiles that currently enter the park use Trail Ridge Road (on average about 4,690 snowmobiles). The portion of Trail Ridge Road open to snowmobiles is about 16 mi. (25.6 km) long and does not provide access to any snowmobile trails outside the park. Trail Ridge Road provides access to four private inholdings and two leased properties located in the Kawuneeche Valley.

However, the portion of Trail Ridge Road providing access to these properties is open to automobiles during the winter.

Snowmobiles access Trail Ridge Road by taking the North Supply Access Trail to Sun Valley Road. Snowmobiles then drive along the edge of Sun Valley Road to Trail Ridge Road. From there they have access to Milner Pass (Figure 1, page 9). The first 10 mi. (16 km) of Trail Ridge Road is dual use for automobiles and snowmobiles. From the Timber Lake trailhead to Milner Pass, a distance of about 6 mi. (10 km), automobiles are not permitted on the roadway. The 10 mi. portion of Trail Ridge Road that is open to snowmobiles and automobiles is usually not plowed to pavement. About 3 in. (8 cm) of snow is normally left on the road.

The North Supply Access Trail leads to 17 named snowmobile routes on the USFS Stillwater Trail OHV System. These routes total about 92 mi. (148 km). The Idleglen parking lot is the closest alternative access to the USFS Stillwater Trail OHV System from the town of Grand Lake. To reach the Idleglen parking lot from Grand Lake, snowmobiles would have to be driven across Shadow Mountain Lake, or they would have to be transported 6 mi. by trailer to the parking lot. The following issues have been identified if RMNP was closed to snowmobiles and access was redirected to the Idleglen parking lot:

- Currently rental companies cannot trailer snowmobiles to or stage snowmobiles from the Idleglen Trailhead Parking area. This activity would require a commercial outfitter/guide special use permit. Idleglen Trailhead is currently filled to capacity during peak use periods with non-commercial users. Presently, the USFS believes that the off-site commercial snowmobile rentals vs. the on-site non-commercial public parking at Idleglen Trailhead is an adequate mix of accommodation, and thus a prospectus to allocate commercial use of the facility is not planned in the near future. The USFS presently has a “defacto moratorium” for any company wanting a permit to offer guide services. The USFS cannot allocate guide permits without first doing a capacity analysis, and presently there is no plan to do one (Arapaho and Roosevelt National Forests and Pawnee National Grassland final EIS 1997). Therefore, rental businesses would need to provide trailers so renters can transport snowmobiles to the parking area. This would increase the cost of the rental and private vehicles would have to be equipped with a trailer hitch. Many vehicles do not have trailer hitches.

Rental companies in Grand Lake presently require people renting ATVs or personal watercraft to trailer them with their own personal vehicle because of the issue related to guide services on the Arapaho National Recreation Area or other USFS managed land.

- The 1999/2000 Grand Lake Snowmobile Trail Map, as well as local businesses in Grand Lake and the USFS, do not recommend snowmobile travel on Shadow Mountain Lake because of the potential for open water and

thin ice. Snowmobile riders have been killed on Shadow Mountain Lake when they have run into open water (Noble Underbrink, personal communication).

Shadow Mountain Lake is a man-made reservoir that is part of the Colorado-Big Thompson transmountain water diversion project. Runoff on the west side of the Continental Divide that would normally flow down the Colorado River is captured in Shadow Mountain Lake, Lake Granby and other reservoirs and is diverted via the Alva B. Adams Tunnel to the Big Thompson River located east of the Continental Divide. The Alva B. Adams Tunnel is fed by Grand Lake, which is a natural lake. Grand Lake is connected to Shadow Mountain Lake by a short stretch of the North Fork of the Colorado River. Shadow Mountain Lake was constructed at the same elevation as Grand Lake, and the water level in both lakes is maintained at the same elevation. During the winter, a tremendous quantity of water is pumped from Lake Granby to Shadow Mountain Lake. This water flows into Grand Lake and through the Alva B. Adams Tunnel to fill reservoirs on the east side of the Continental Divide and to generate hydroelectric power. This flowing water creates thin ice and open water on both Shadow Mountain Lake and Grand Lake. Because the lakes provide a basically level surface, riders are tempted to travel at a high rate of speed, which exacerbates the problem.

- Traveling along the edge of Shadow Mountain Lake rather than on the lake ice is also not feasible because the land along the lakeshore is privately owned. It is very unlikely that these landowners would grant access across private property.
- The snowmobile season would be shortened if snowmobile riders had to travel on Shadow Mountain Lake. Travel on Shadow Mountain Lake is not an option in the early part of the snowmobile season because the lake is not frozen. The same is true toward the end of the season as the lake begins to thaw.
- Idleglen parking lot is too small (estimated to hold about 30-vehicles with trailers) even for the current amount of use it receives. On most weekends throughout the winter the parking lot fills and overflow parking occurs along County Road 4. Accommodating any additional demand for parking would not be feasible at this time (Bill Dunkelberger, personal communication). The USFS has a long-term plan to increase the size of the parking lot, but this is three to five years in the future and was not planned to accommodate rental snowmobiles if they were trailered from Grand Lake.
- A large percentage of snowmobile users entering RMNP rent snowmobiles in Grand Lake, and they usually rent them for a two to four-hour ride. The four-hour ride is the most popular. Currently snowmobile riders can rent a snowmobile in Grand Lake and travel directly to USFS land via the North

Supply Access Trail. Trailering snowmobiles to the Idleglen parking lot or snowmobiling down Shadow Mountain Lake to access USFS land would extend rental times by one to two hours depending on weather, traffic and available parking. Extending rental times by one to two hours would eliminate two-hour rides. Some renters would reach the Idleglen parking lot and find it full, especially on weekends.

- If snowmobile riders had to access the Idleglen parking lot by traveling on Shadow Mountain Lake, they would also have to cross some private land (Figure 2, page 11). Private landowners presently tolerate some snowmobile traffic through their property, but might object to a significant increase in snowmobile traffic, which would likely occur if the park was closed to snowmobiles
- Snowmobile riders would have to cross Highway 34 in a location that is more dangerous than where they cross now. Snowmobiles presently have to cross Highway 34 before they enter the park to use the North Supply Access Trail. The Colorado Department of Transportation (CDOT) has safety concerns about the current crossing and is working with the Town of Grand Lake to try and provide the safest possible crossing. The posted speed limit where the trail presently crosses the highway is 35 mph (60 km/h). Where snowmobiles would cross Highway 34 after traveling across Shadow Mountain Lake the posted speed limit is 50 mph (80-km/h). During the winter there is often ice and snow on the highway and braking distances are longer. However, it is possible to post new speed limits and warning signs about snowmobiles crossing the highway.
- To reach the Idleglen parking lot from Shadow Mountain Lake, snowmobiles must travel on County Road 4. This section of road is presently designated as a dual use road for snowmobiles and automobiles (Grand Lake Snowmobile Trail Map 1999/2000). Private landowners along the road presently tolerate some snowmobile traffic but may have some concerns if the snowmobile traffic increases significantly.
- The bald eagle is currently protected under the Endangered Species Act and is listed as a threatened species. The area below the Shadow Mountain Lake dam is closed in winter to protect bald eagles. The USFS and RMNP jointly manage this closure. RMNP and the USFS share a concern about protecting winter bald eagle habitat if more riders are using Shadow Mountain Lake. Some riders may be tempted to enter the closed area below the dam. Noise from snowmobiles, even if the snowmobiles did not enter the closed area, could be significant enough to affect some eagles. Because of successful recovery efforts, The U.S. Fish and Wildlife Service (FWS) is currently considering whether to remove the bald eagle from the Endangered Species List. However, even if the species is delisted, the bald

eagle closure will continue under 36 CFR § 1.5 (a) (1) and 1.5 (3) to protect sensitive wildlife resources.

3.1.2 Geology, Soils and Vegetation

Geology and Soils

The park features an ecologically typical and exceptionally scenic portion of the Southern Rocky Mountains. The mountains were formed by a series of granitic batholiths intruded into precambrian micashists and pegmatites. The Continental Divide passes roughly through the middle of the park dividing it into two distinct sides. Steep cliffs characterize the eastern slope with U-shaped valleys created by local plesitocene glaciation. The east slope sits in a slight rain shadow receiving about 15 in. (38 cm) of precipitation annually, and is subjected to high Chinook winds throughout the winter. In the west, the mountains fall away more gradually to the Kawuneeche Valley. The western slope receives about 20 in. (51 cm) of precipitation annually with deeper winter snows than the eastern slope.

The geology associated with the park is generally igneous metamorphic rock and glacial till. An Order 2 soil survey was completed in the lower elevation areas of the park and an Order 3 soil survey completed for the other areas of the park in 1998 (Natural Resources Conservation Service 1999). Most soil series in the park are classified in the cryic soil temperature regime. There is some field-measured data available that suggest soils at high elevations and under spruce-fir forest would meet the requirements of the isofrigid soil temperature class. Specific soil types exist, but types generally depicted include Cryochrepts, Cryoboralfs and Cryaquepts. The Cryochrept type is well drained with moderately rapid permeability and slow runoff. Cryochrepts are generally in the glacial till areas and are deep to very deep. They may have large stones and boulders on the surface as well as in the profile. The erosion hazard is slight to moderate. The Cryoboralfs are moderately well to well drained with moderate permeability and moderate runoff. The erosion hazard is slight. The Cryaquepts are poorly to very poorly drained, with slow to moderate permeability and slow runoff. They are found in the wetter, flatter areas, such as Kawuneeche Valley. Erosion is slight unless slopes are denuded of vegetation.

RMNP and the Water Resources Division of the NPS, concerned about possible pollution from snowmobiles, analyzed soil samples along the North Supply Access Trail in May 2000. The samples were analyzed for polycyclic aromatic hydrocarbons (PAH). PAH are formed in the combustion process of snowmobiles and are known environmental toxicants.

The study revealed that PAH are in the soil directly under and immediately adjacent to (1-3 meters away) the North Supply Access Trail. Since PAH concentrations were much higher in the soil directly under the trail, it is quite possible this contamination was caused by snowmobile emissions that moved from snow on the trail to the soil during the spring melt (VanMouwerik, 2000). More samples would define this better. Contaminated soil can harm invertebrate organisms in soil and also be transported to nearby water resources in runoff.

Vegetation

Because of its great variations in elevation, soils, and climate, RMNP is something of a botanical crossroads, with nine distinct floras ranging from ponderosa pine and grass/shrub meadows to alpine tundra. About 1,025 vascular plants have been identified in the park. Most of the vegetated landscape is dominated by forests such as ponderosa pine, lodgepole pine, and spruce/fir, or by non-forested alpine tundra.

Roughly 60% of the park is forest, 13% alpine tundra, 18% exposed rock and 9% a mixture of other habitat types. Major vegetation types consist of ponderosa pine and grass/shrubland habitat from 7,800 ft. to 8,500 ft. (2,380 m to 2,600 m), lodgepole pine from 8,500 ft. to 9,500 ft. (2,600 m to 2,900 m), spruce/fir from 9,500 ft. to 11,500 ft. (2,900 m to 3,500 m), and alpine tundra over 11,500 ft. (3,500 m). Lodgepole pine and spruce/fir characterize the west side of the park. The west side of the Kawuneeche Valley leads up to the majestic Never Summer Mountains. The Continental Divide lies mostly to the east of the valley. The Kawuneeche Valley is about 9 mi. (14.4 km) long and ½ mi. (0.8 km) wide and is composed of marshes, bogs, ponds, and wet meadows dominated by sedges and willows.

Prior to the establishment of RMNP, numerous anthropic disturbances occurred on sites now within the park. The anthropic disturbances varied considerably as to type, intensity, and duration of disturbance, but disturbances in the Colorado River District included mines, homesteads, sawmills, roads, settlements, lodges, cabins, camps, livestock grazing, haying and water diversion. Some of these disturbances (e.g. logging, mining and ranching) occurred in the Kawuneeche Valley beginning in the 1870s. Logging and most mining operations ended by 1920, but ranching continued into the 1930s. Some disturbances such as water diversion are still occurring.

The Grand Ditch is located within the Colorado River District of the park and is the biggest water diversion within RMNP. The Grand Ditch is significantly impacting the North Fork of the Colorado River and its associated wetlands in the Kawuneeche Valley (RMNP Resources Management Plan 1998). The ditch was constructed from 1894 to 1935, and traverses the Never Summer Mountains in RMNP for a distance of about 17 mi. (27 km). It is entitled to divert up to 524.6 cubic feet of water per second under a water right with a priority date of September 1, 1890, which predates the establishment of the park by 25 years.

The Grand Ditch is still in operation, but many of the other early disturbances have been removed and the areas restored to natural conditions. The Never Summer Ranch was left intact in the Kawuneeche Valley, which provides visitors with an opportunity to view a ranch as it might have looked in the late 1800's. The buildings are open to the public in the summer but closed in the winter.

About one percent of the land in the park is considered developed. These areas include roads, frontcountry campgrounds, visitor centers, employee housing, utility areas and private inholdings. About 95% of the land in the park is roadless and is recommended for wilderness or is already designated wilderness.

One of the more serious impacts presently occurring to native vegetation is the invasion of exotic plants. Some of them are invading the park and threatening the integrity and biological diversity of native flora and fauna. Of 1,025 known vascular plants in the park, 81 of them are exotic. Twenty-eight exotic species are considered species of concern (Draft RMNP Exotic Plant Management Plan, 2000). However, these exotic plants are located in the lower elevations of the park below 9,000 ft. (2,750 m), and mostly on the east side of the Continental Divide. The Colorado River District is relatively free of exotic species of concern. The plants of concern in the Kawuneeche Valley are scentless chamomile (*Anthemis cotula*), ox-eyed daisy (*Chrysanthemum leucanthemum*) and Canada thistle (*Cirsium arvense*). Snowmobiles do not appear to have any impact on the spread of invasive exotic plants.

The only disturbance that plays a major role in altering vegetation and soils in the park is fire. The forests of much of Northern North America are strongly fire-dependent. Fire is the major agent that initiates and terminates vegetation succession; it controls the age, structure, species composition and physiognomy of the vegetation; it produces the vegetation mosaic on the landscape and it influences nutrient cycles, energy flows, productivity, diversity, and stability throughout the ecosystem (Heinselman 1978). Fire frequency in spruce/fir forests is 300 to 700 years and is considerably more frequent in lodgepole pine at 100 to 150 years (Jesse Duhnkrack RMNP, personal communication).

About 63 % of the park is designated Wildland Use Zones. If fire starts naturally by lightning in these use zones, and if certain important parameters are met, a wildland fire can be managed for resource benefit. These Wildland Use Zones are in the more remote areas of the park.

3.1.3 Natural Sound and Night Sky

RMNP contains various tangible natural and cultural features, such as animals, plants, waters, geologic features, and historic buildings. The park also contains intangible qualities such as natural quiet, solitude, space, natural light and scenery. A night sky free from light pollution is considered an important resource. Both tangible and intangible resources are equally important in management decisions affecting park resources. The NPS is responsible for “preserving the natural conditions and scenic beauties thereof” (38 Stat. 800). Human caused noise intrusions disrupt the experience sought by visitors to the park and impact wildlife. The NPS will strive to preserve the natural quiet and natural sounds associated with the physical and biological resources of the park.

About 95 % of the park is recommended, potential or designated wilderness, where natural quiet, solitude, space and natural light are considered important resources. These attributes are important to park visitors. At least 75 % of visitors who visit the Colorado River District via Trail Ridge Road do not enter by snowmobile. They seek other types of activities or forms of recreation such as skiing or snowshoeing. Most visitors (82%) consider tranquility an extremely important feature of the park (Valdez 1996).

A yearlong visitor use survey was completed in 1994/1995 (Valdez 1996). The survey was designed to better understand visitor perceptions of the park, and identify ways to better accommodate visitors. It was a general survey and not specifically designed to acquire information about snowmobiles, but the survey conducted during the winter did ask visitors what their main winter activity was and some mentioned snowmobiles. The survey results have helped the park evaluate and improve park operations.

Twenty-one days were randomly selected throughout a 12-month period. A total of 4,148 visitors were contacted as they left the park and 3,405 (82 %) agreed to participate. The visitors were asked a variety of questions including what was their main activity while they were in the park. The following results are noteworthy:

- 50% were taking photographs
- 73% were enjoying the natural scenery
- 29% were driving Trail Ridge Road
- 2% of visitors to the park in the winter were snowshoeing
- 2.6% were skiing
- < 1% were snowmobiling

Visitors leaving the Colorado River District who were surveyed listed the following as a main attraction to the park:

- 74% said natural scenery
- 6% tranquility
- 8% recreation

Visitors leaving the Colorado River District listed the following as extremely important features of RMNP:

- 83% listed natural scenery
- 82% listed tranquility
- 83% listed clean air
- 82% listed clean water
- 82% listed wildlife
- 81% listed undeveloped vistas
- 81% listed alpine tundra
- 79% listed night sky

Visitors placed a particular premium on both solitude and serenity. Visitors were not asked specific questions about snowmobiles other than if it was one of their main activities, but visitors clearly stated that tranquility was an important feature in RMNP. Visitors were asked about noise from commercial and emergency helicopter overflights:

- 81% said commercial overflights would impact their park experience
- 78% favored using helicopters in emergency situations

In 1998 data collection was started for the development of a study plan to characterize ambient sound in RMNP. The project was designed to evaluate noise characteristics in the park with respect to noise from aircraft tour overflights. This study plan could have provided some information on snowmobile noise. However, Section 806 of the National Parks Air Tour Management Act of 2000 permanently banned commercial air tours over the park, and the study was suspended after Phase 1 was completed. The 1998 data collection was the first noise study in RMNP, but there have been numerous other noise studies in other NPS units and on lands managed by other federal agencies. Bowles (1995) mentions that any animal that heard a human caused sound and alters their normal functioning behavior should be a concern. Snowmobiles are noisy and have disrupted wildlife in Yellowstone National Park (Oliff et al. 1999).

3.1.4 Aquatic, Wetland, Riparian Communities and Floodplains

RMNP is at the headwaters of four major river basins: the Big Thompson, North Fork of the Colorado, North Fork of the St. Vrain, and the Cache La Poudre rivers. The Continental Divide bisects the park into two different watersheds, east and west. The North Fork of the Colorado River is located west of the Continental Divide and the other river basins are located east of the Continental Divide.

The aquatic ecosystem in the park consists of 147 lakes (about 1,103 surface ac. [450 ha]) and 473 mi. (757 km) of streams. Historically water quality was excellent with only natural siltation affecting quality. Today, visitor use and atmospheric deposition are negatively altering water quality. Portions of the Kawuneeche Valley form the largest wetland/riparian community in the park.

Many of the high elevation lakes and streams above natural barriers were originally without fish. Today, at least 51 of the lakes have trout populations, mostly due to stocking by settlers or early park managers. Up until 1969 lakes were stocked with only exotic trout, which ultimately displaced the native species. In the late 1970's park managers ceased stocking exotic trout and began to restore habitat with native trout.

Fish are important components of aquatic ecosystems and are important links in the transfer of energy between aquatic and terrestrial environments (Ruzycki and Lutch 1999). In RMNP there are five species of trout of which two, the greenback cutthroat trout (*Salmo clarki stomias*) and the Colorado River cutthroat (*Salmo clarki pleuriticus*), are native to the park. The greenback cutthroat is federally listed as threatened and is protected under the Endangered Species Act. However, the greenback cutthroat trout does not occur on the west side of the park and is not affected by snowmobiles. The Colorado River cutthroat is a species of concern in the state of Colorado and does occur in 1st order lakes and streams in the upper watershed of the North Fork of the Colorado River (Bruce Rosenlund, personal communication). This species is presently found above LuLu City in the North Fork of the Colorado, in the North Inlet, East Inlet, Timber Creek and Timber Lake. Snowmobiles are not used in any area where the Colorado River Cutthroat presently occurs. The only fish

that occur in the Kawuneeche Valley near Trail Ridge Road or the North Supply Access Trail are exotic trout such as the brook and brown trout.

In March 1999 the states of Colorado, Wyoming and Utah and the U.S. Fish and Wildlife Service (FWS) signed a conservation agreement for the Colorado River Cutthroat. In December 1999 several environmental organizations submitted a petition to the FWS to list the Colorado River Cutthroat as endangered. Because of other priorities, the FWS is presently not doing the analysis that is required to determine if listing is warranted, but will do so in the future (Bruce Rosenlund, personal communication). Restoring Colorado River Cutthroat to former habitat in the Kawuneeche Valley may occur in the future.

Pollution from snowmobiles has the potential to impact fish (Ruzycki and Lutch 1999). The Colorado River cutthroat is a species of concern because of human exploitation, environmental degradation, and competition and predation from exotic or introduced fish species.

RMNP and the Water Resources Division of the NPS, concerned about possible pollution from snowmobiles, analyzed snow, water, sediment and soil samples along the North Supply Access Trail in April and May 2000. The samples were analyzed for the following contaminants: benzene, ethyl benzene, toluene, xylenes (collectively called BTEX), methyl tertiary butyl ether (MTBE), and polycyclic aromatic hydrocarbons (PAH). PAH are formed in the combustion process of snowmobile engines, and BTEX and MTBE (if present) are a part of the unburned fraction of fuel (estimated to be 20 to 40%) emitted by snowmobiles (VanMouwerik 2000). The inorganic compounds sulfate and ammonium also occur in snowmobile emissions, but were not studied.

BTEX were chosen because 1) they are emitted in such great quantities from snowmobiles and therefore are perceived by the general public as being a threat, and 2) very little data exists for them in snow along snowmobile trails or adjacent waters. Even though MTBE was not permitted in Colorado gasoline supplies last winter, it was chosen because 1) it is also perceived by the general public as being a threat, 2) very little data exists for it in snow along snowmobile trails or adjacent waters, and 3) some gas stations in Colorado may have illegally sold gasoline last winter with MTBE in it (or snowmobilers may have brought it in from out-of-state). PAH were chosen because they are known components of snowmobile emissions and known environmental toxicants.

Beaver have influenced streams and lakes in the park. Elk and moose also have a significant impact on aquatic/riparian areas in the park, particularly in the Kawuneeche Valley because of their feeding on willow and other aquatic plants. During the winter moose are attracted to Trail Ridge Road because of salt on automobiles. Several moose have become habituated to visitors and they frequent parking areas to lick salt off the sides of vehicles. Snowmobiles rarely travel on bare pavement where salt is used and therefore do not get road salt on them the way automobiles do. Therefore, moose are not expected to approach parked snowmobiles looking for salt.

Several noxious weeds are also invading lower elevation wetland habitats and are partially influenced by disturbance activities caused by visitors and possibly wildlife, but probably not influenced by snowmobiles.

3.1.5 Endangered, Threatened and Rare Species

Appendix I contains the list of endangered, threatened or rare species for RMNP. These species are either known to currently occur in RMNP or have been observed in the park historically. Appendix II lists the sources used by RMNP to identify endangered, threatened or rare species that must be protected. The following federal and state listed endangered or threatened species are present in the Colorado River District during the winter, or have recently been sighted:

Federally listed species: bald eagle (*Haliaeetus leucocephalus*), lynx (*Felis lynx canadensis*)

State listed species: bald eagle (*Haliaeetus leucocephalus*), lynx (*Felis lynx canadensis*), wolverine *Gulo gulo*, river otter (*Lutra canadensis*)

The following rare species are present at some time during the year, or have recently been sighted, but not necessarily during the winter months when snowmobiles are in use:

Rare species: wood frog (*Rana sylvatica*), Northern goshawk (*accipiter gentilis*), Greater sandhill crane (*Grus canadensis tabida*), osprey (*Pandion haliaetus*), mountain sucker (*Catostomus platyrhynchus*), Colorado river cutthroat trout (*Oncorhynchus clarki pleuriticus*), middle park penstemon (*Penstemon cyathophorus*)

Other federal and state-listed species such as the gray wolf (*Canis lupis*) and grizzly bear (*Ursus arctos*) used to occur in RMNP but are presently extirpated. Despite extensive surveys (see discussion about the lynx), there have been no confirmed observations of the wolverine (*Gulo gulo*) in RMNP since the late 1800's, and it is almost certain that this species has also been extirpated.

Lynx

The lynx (*Lynx canadensis*) is federally listed as threatened in the lower 48 states. The lynx was extirpated from Colorado, which includes RMNP, or there were too few to maintain a viable population (Seidel et al. 1998, Reed et al. 1998, Ruggiero et al. 1994). In the past nine years several surveys have been conducted to determine the presence of lynx and the health and abundance of their primary prey, the snowshoe hare. During the winter of 1990-1991 a track survey of lynx and wolverine was done in RMNP and the surrounding Arapaho and Roosevelt National Forests (Andrews 1991). No tracks of either species were observed. During the winter of 1997-1998 wildlife technicians conducted track surveys in the park to determine the density of snowshoe hares and also looked for tracks of the lynx and wolverine (Reed and Byrne 1998). During the summer of 1998, Kreb's Pellet Plot Transects were conducted to determine an estimated number of snowshoe hares per hectare (Byrne and Reed 1998). While documenting snowshoe hare, wildlife technicians also looked for tracks of the lynx and wolverine but none were

found. Further surveys for lynx were conducted during the summer of 1999 by the use of hair snags and scent stations. The results of the hair snag survey confirmed the presence of bobcat but no lynx. Presently no lynx exist in RMNP. Besides surveys in RMNP, other surveys were conducted elsewhere in Colorado with similar results (Seidel et al. 1998).

Because of a lack of relic lynx in the state of Colorado, the Colorado Division of Wildlife (CDOW) began a vigorous reintroduction program. During the winters of 1998/1999 and 1999/2000, CDOW reintroduced 96 lynx into the San Juan Mountains in southwestern Colorado with the purpose of reestablishing a viable population. Some of these animals dispersed to other areas within the state. It is important to note that two reintroduced radio-collared male lynx moved north from the San Juan Mountains and spent some time in RMNP and surrounding USFS land. Both lynx were in the park during the late fall/winter of 1999 and one spent some time in the park in January 2000. One lynx entered the park via the Indian Peaks Wilderness and passed through the east side of the park into the Mummy Range and on into Nebraska where it was shot and killed. The other lynx spent time in the Never Summer Mountains in and outside the park and close to Kawuneeche Valley. That lynx left the park and is currently back near its release site. At this time there are no radio-collared lynx in Northern Colorado (Steve King, personal communication).

RMNP would like to reestablish a breeding population of lynx. It is possible that other reintroduced lynx may establish themselves in Northern Colorado, utilizing the park and adjacent USFS land. If lynx became established in RMNP, the NPS would like to supplement the animals with others to try and establish a breeding population in the park. However, CDOW is in charge of the reintroduction of lynx in Colorado and considers the establishment of a breeding population in the San Juan Mountains their top priority. CDOW would not assist RMNP in supplementing lynx in the park at this time. RMNP is a signatory to the draft State of Colorado Conservation Strategy for Lynx and Wolverine, and the reintroduction of the lynx could occur at RMNP in the future (Seidel et al. 1998). If lynx ever become established in RMNP, the FWS will be consulted on future National Environmental Policy Act (NEPA) compliance documents relating to lynx or their habitat. RMNP will consider impacts to potential lynx habitat in this EA.

The land surrounding the Kawuneeche Valley, a portion of the Kawuneeche Valley and a large portion of the Colorado River District is potential lynx habitat. Roads and snowmobile trails are an important aspect of winter recreation because they provide people with access to wildlands. However, the type, density, and distribution of roads and trails in lynx habitat affect the rate at which lynx are disturbed or even killed illegally (Halfpenny et al. 1999). Trail Ridge Road provides access into the Kawuneeche Valley and adjacent USFS land in the Never Summer Wilderness. Thompson (1987) noted that all known lynx sightings on Vail Mountain Ski Area, Colorado, were animals that were shot (1 animal) or illegally trapped (2 animals). Hunting or trapping lynx is not legal in Colorado, but hunting and live trapping bobcat is. Because the two species are similar in appearance, there is the chance that a lynx may accidentally be killed. Hunting is not

allowed in RMNP, but the park does provide hunter access to adjacent USFS land where hunting is permitted. Poaching does occur in the park on an occasional basis.

Humans alter the structure, biotic composition and arrangement of habitat components that are essential to lynx. Winter recreation and its associated infrastructure reduces the amount of suitable habitat available to lynx and reduces the effectiveness of pristine habitat because human disturbance causes lynx to avoid habitats that are otherwise suitable (Oliff, et al. 1999).

Lynx are very specialized carnivores, requiring snowshoe hares as part of their diet and mature conifer/fir forests for denning. Because of these requirements, lynx are potentially affected by snow-based recreational activities that occur in cold forest habitats. Winter recreation in potential lynx habitat in RMNP may affect lynx if they were ever reintroduced. The following restrictions will be considered and possibly implemented if lynx or another federally or state threatened or endangered animal such as the wolverine is reestablished in RMNP:

1. Destination areas: Human activity at destination areas has the potential to affect lynx, as this species avoids habitat near human facilities (Halfpenny et al. 1982). Increased human use in lynx habitat may cause lynx to increase avoidance of those areas. Some public use of destination areas may need to be restricted.
2. Primary transportation routes and scenic driving routes: Maintained or unmaintained roads provide recreational access. Disturbances associated with automobiles, snowmobiles and recreationists may pose a risk to denning lynx. Transportation routes used by snowmobiles and automobiles would have to be analyzed for impacts, wherever lynx establish a den.
3. Groomed motorized snowmobile routes may reduce the effectiveness of lynx habitats that are peripheral to groomed trails. Night use may be more detrimental than day use because lynx are nocturnal and crepuscular. Restrictions on quantity and timing of snowmobile travel could reduce adverse effects on lynx.
4. Backcountry motorized areas: Snowmobiles and automobiles are presently used on Trail Ridge Road, which follows the edge of the Kawuneeche Valley for 10 mi. (16 km). Once snowmobiles leave the Timber Lake Trailhead, Trail Ridge Road becomes a motorized backcountry road for snowmobiles for an additional 6 mi. (9.6 km) east to Milner Pass. The Kawuneeche Valley and Trail Ridge Road beyond the Timber Lake Trailhead is within potential lynx habitat. Because snowmobiles are highly obtrusive, they have the potential to displace lynx from winter habitat, increase stress levels, and reduce the fitness and viability of lynx populations (Cole and Landres 1995 cited in Oliff et al. 1999). Even if Trail Ridge Road remains open to snowmobiles as proposed in Alternatives 2 or 3, RMNP may still need to impose some restrictions on their use beyond the Timber Lake Trailhead if lynx were reestablished in the park.
5. Backcountry skiing and snowshoeing may affect lynx when the activity occurs at high levels of use. Therefore, skiers and snowshoers may be directed away from high-quality lynx habitat when lynx are in the area. Access to prime lynx habitat such as a den should be restricted.

3.1.6 Wildlife

RMNP is rich in species diversity. Encompassing three major life zones (montane, sub-alpine and alpine) and plant communities ranging from willow carrs, ponderosa pine, lodgepole pine, spruce/fir forests to alpine tundra, the park offers a great variety of habitats for wildlife. There are 260 species of birds, 66 species of mammals, 11 species of fish, and five species of amphibians. There is only one species of reptile known to occur within the park. Common species found in the Colorado River District during the winter include moose, river otter, pine marten, chickaree, snowshoe hare, coyote, red fox, porcupine, gray jay, stellar's jay, pine siskin, great-horned owl, hairy woodpecker, mountain chickadee and dark-eyed junco.

Beaver are also common animals in the Colorado River District, especially in the Kawuneeche Valley. The beaver population at this time is dramatically smaller than 150 years ago. This is due mainly to trapping by early explorers, the draining of riparian systems by settlers, and possibly from recent diseases that have affected the species locally. The Kawuneeche Valley contains the largest population of beaver in the park. Packard (1947) estimated the population of beaver in the Kawuneeche Valley at about 630 animals. Mitchell et al. (1999) resurveyed the Kawuneeche Valley for beaver and found 19 active sites with 9 lodges and 5 burrows. Mitchell et al. did not make a specific population estimate, but it is safe to say that the population today is significantly less than what Packard documented in 1947. Most of the beaver activity is away from Trail Ridge Road and it is unknown if automobiles, snowmobiles or visitors have any adverse effect on this species.

A large percentage of the North Supply Access Trail passes through young lodgepole pine that has limited wildlife value. Park flora and fauna databases indicate it is the least biologically diverse habitat in the park. Lodgepole pine covers about 21% of the park. A large percentage of the lodgepole pine in the Colorado River District is older mature forest, but along the North Supply Access Trail the forest is a younger even-age stand and at an earlier successional stage. The forest along the North Supply Access Trail is dense, with high levels of dead and down trees and little understory vegetation. Older lodgepole pine with an understory of shrubs and other herbaceous plants is much more important to many species of wildlife.

Park personnel have reduced fuel loads in the vicinity of the North Supply Access Trail by using chainsaws to cut dead and down trees. This has been done to help prevent wildland fires from jeopardizing NPS structures and private homes adjacent to the park. As previously mentioned, the North Supply Access Trail is a fire access road, and also acts as a fire break in the event of a wildland fire. Thinning the forest will provide better wildlife habitat and as the forest matures more wildlife is expected to use the area than at present. Because many bird species migrate south or to lower elevations during the winter, fewer species of birds use lodgepole pine during the winter months as compared to the summer months.

Because of the type of habitat that can be found along the North Supply Access Trail, wildlife species are naturally at lower numbers than can be found in older lodgepole pine

forests, in riparian areas of Kawuneeche Valley, along Trail Ridge Road, or in spruce/fir forests.

Wildlife is an important component of the RMNP experience, and a major economic draw to the area. The gateway communities of Estes Park and Grand Lake promote wildlife viewing. Ungulates such as elk, mule deer and bighorn sheep draw the most attention, particularly during the fall, winter and early spring months. A total of 83% of the visitors surveyed in the 1996 Visitor Use Survey rated wildlife as an extremely important feature in RMNP. During the winter months elk and mule deer can be found on their winter range on the east side of the park.

According to Colorado Division of Wildlife (CDOW) Wildlife Resource Information System (WRIS) data, Trail Ridge Road runs along the edge of elk winter range for the lower six miles of the Kawuneeche Valley. Trail Ridge Road does not pass through nor is it adjacent to severe winter range of the elk. WRIS data indicate that the North Supply Access Trail is within elk winter range, but the forest around the trail provides very little forage. CDOW District Wildlife Manager Jerry Claassen and RMNP Colorado River District Ranger Bob Love both disagree with the WRIS data, and both state that elk are rarely, if ever, observed in the Kawuneeche Valley, along Trail Ridge Road, or in the vicinity of the North Supply Access Trail during the winter.

Moose winter throughout the Kawuneeche Valley and are the center of attention, usually being seen more often in the winter than in the summer. They frequently cross the North Supply Access Trail during the winter months, but spend little time around the trail, probably because of a lack of forage and disturbance by snowmobiles.

Winter recreation activities can affect wildlife behavior and survival (Caslick 1997). In Wyoming and Montana snowmobile use has impacted elk, buffalo, trumpeter swans, deer, small mammals, bald eagles and bighorn sheep (Caslick 1997). There have been no studies of winter recreation activities in RMNP, and there is limited documentation of snowmobiles, skiers or snowshoers impacting wildlife. There have been observations of snowmobiles chasing and harassing moose along Trail Ridge Road.

Bighorn sheep occur in the Milner Pass area and snowmobiles that drive up to the pass may have an effect on their winter range, but what effect they may have is unknown (Dave Stevens personal communication). In RMNP there have been studies on visitors' effects on animals at other times of the year. Friedrickson (1977) studied responses of rodents to visitors. McCutchen (1989) studied black bears and Zeigenfuss (2001) analyzed the data from McCutchen's research. The Zeigenfuss report indicates that the Milner Pass area has potential black bear den habitat. Schultz and Bailey (1978) studied responses of elk to human activity, and Tombeck and Taylor (1986) studied tourist impacts on Clark's nutcrackers. Stevens and Hanson (1986) documented stress to bighorn sheep in Horseshoe Park because of high visitor use in the area and the existence of a road between their escape terrain and a natural mineral lick. All of the above mentioned research showed that the wildlife that was studied exhibited a negative response because of human activities.

RMNP has problems with visitors feeding wildlife and some animals have become habituated to feeding. In recent years park rangers have had to remove mule deer, coyote and black bear because some individual animals posed a threat to park visitors.

Even though documentation of the effect of winter recreation on wildlife is lacking in RMNP, research and documentation that has been done elsewhere does support the conclusion that the current level of winter recreation in RMNP is having some effect on wildlife. The extent or amount of impact has not been fully explored or determined.

3.1.7 Wilderness

RMNP is an example of wilderness that is sparsely inhabited. About 95% of the park is recommended or designated wilderness. The Wilderness Act (1964), NPS-41 Wilderness Preservation and Management and the 1994 NPS-77 Natural Resources Management Guidelines provide guidance for wilderness management. NPS-41 states that compromise of wilderness resources or character can occur only if those actions have localized short-term impacts.

The Wilderness Act established a national wilderness preservation system. The policy as written into the Act is as follows:

It is ... the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness. The Act defines wilderness as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. Wilderness is further defined to mean ... an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions ... (Wilderness Act, 1964).

RMNP's 1976 Master Plan includes a land classification system that divides the park into management zones. These zones are recommended and potential wilderness (93%), designated wilderness (2%), administrative (1%), historic (2%), and roads, etc. (2%). RMNP will take no action that will diminish the wilderness suitability of an area recommended for wilderness designation until the legislative process for wilderness designation has been completed (Draft Backcountry Management Plan).

In the Kawuneeche Valley, recommended wilderness is located on both sides of Trail Ridge Road, and the North Supply Access Trail is adjacent to recommended wilderness for about 0.6 mi. (1 km) where it follows the Sun Valley Road.

3.1.8 Air Quality

An important component of RMNP is clean air. The Clean Air Act (1977) recognizes the need to protect visibility and air quality in national parks. RMNP is a mandatory Class I

area. Park wide, the west side of the park experiences cleaner air than the east side (NPS Air Quality Records, park files). However, snowmobiles can emit significant amounts of hydrocarbons, carbon monoxide, and particulate matter (PM) because of the use of two-stroke engines (White and Carroll, 1998). On a per passenger mile basis, a two-stroke engine in a snowmobile emits about 36 times more carbon monoxide and 98 times more hydrocarbon than an automobile (Barry 2000). Because fuel and oil are combined together in conventional two-stroke engines, lubricants contribute to engine emissions. An aerosol of uncombusted lubricant is the primary source of two-stroke particulate emissions, as measured gravimetrically from diluted exhaust gas. Up to one-third of the fuel delivered to the engine of a snowmobile goes straight through without being burned. The emissions of oil and gas results in high emissions of air pollutants (NPS Air Resources Division, 2000).

Visibility is impaired in the park about 100% of the time, but is noticeable to the human eye about 90% of the time. Sources are mostly from outside RMNP but the NPS does not have data that link pollutants to specific sources. Air pollution can come from many sources, including the Front Range of Colorado and as far away as Mexico, Texas, and Los Angeles, California. Exhaust from snowmobiles does at time degrade visibility in the Kawuneeche Valley. Automobiles and snowplows also impact visibility in the Kawuneeche Valley, but the two-stroke engine in snowmobiles clearly causes the largest impact. Research is needed to document what role snowmobiles play in impacting visibility in RMNP.

Research indicates that nitrogen deposition along the Front Range of Colorado up to the Continental Divide (which includes RMNP) is greater than in any other state west of the Mississippi River, except for parts of California and Arkansas (Williams et. al. 1996). Net deposition of nitrogen do not support a widespread increase in atmospheric nitrogen deposition throughout the Colorado Rockies from the mid-1980's throughout the 1990's, but do support an increase at high elevation areas in the Colorado Front Range that includes RMNP. High elevation ecosystems in RMNP are at an advanced stage of nitrogen saturation. Tributary streams to Loch Vale in RMNP generally have the highest nitrate concentrations in surface water for the Colorado Mountains. High elevation lakes in RMNP along the east side of the Continental Divide are at an advanced stage of nitrogen saturation that is comparable to watersheds in eastern North America. The nitrogen deposition amounts are lower along the Front Range of the Colorado Rockies, then levels seen in eastern North America, but the advanced stage of nitrogen saturation is comparable and can be attributable to low vegetation biomass, and a short growing season in alpine watersheds. It is unknown if the levels of nitrogen deposition occurring along the Colorado Front Range are occurring in the watershed of the North Fork of the Colorado west of the Continental Divide.

Nitrogen deposition affects aquatic, as well as terrestrial, ecosystems and further research is continuing. Most nitrogen deposition occurs during the summer months. Data from Loch Vale indicates that winter precipitation in the form of snow does not appear to be harmful. However, when the accumulated snowpack melts in the spring, a pulse of contaminants is sent downstream. Nitrogen saturation in forested ecosystems has been linked to serious environmental impacts, which include damage to foliage, premature needle drop, and decline in tree vigor (Williams et al. 1996).

Air quality monitoring on the west side of the park is lacking, but it is known that atmospheric deposition (acid rain or acid precipitation) occurs in the park, particularly during the summer months. The average pH of precipitation near Park Headquarters and at Loch Vale is below 5.0 in the summer, a value lower than natural levels (Keigley and Porter 1986, Baron 1991). In RMNP the lowest pH reading in the Loch Vale watershed in lakes and streams was 5.8 (Jill Baron, personal communication).

3.2 SOCIOECONOMIC RESOURCES and VISITOR USE

3.2.1 Socioeconomic Resources

RMNP is a popular tourist attraction in the state of Colorado. Based on the NPS Money Generation Model, about \$206.7 million in revenue is generated each year from visitors and about 4,135 people related to the tourist industry are employed in Boulder, Larimer and Grand counties, where the park is located.

Along the east slope of the Front Range is a growing metropolitan area that extends from Cheyenne, Wyoming, to Pueblo, Colorado. There are over 3 million people living in this area, all within a relatively short driving distance to RMNP.

Estes Park is the gateway community on the east side of the park and Grand Lake is the gateway community on the west side. The full-time population in the Estes Park area is estimated at 10,000 people. The full-time population in the Grand Lake area is estimated to be 500 people. Grand Lake promotes itself as the “Snowmobile Capital of Colorado,” and the revenue from snowmobile rentals, sales, parts and services is the single most important source of income for Grand Lake during the winter months.

Snowmobile rentals, sales, parts and services directly accounted for approximately \$2.3 million in gross income in the town of Grand Lake from October 1999 to April 2000 (Ryan Monello survey of snowmobile businesses in Grand Lake). This figure does not include the Grand Lake Motor Sports or Black Forest Yamaha outlets, which are located just south of Grand Lake. They have an annual gross income of \$845,000 and \$776,000, respectively, due to snowmobile or snowmobile related sales and services. Snowmobile rentals, sales and service directly create at least 21 year-round jobs and 34 seasonal jobs from October through April in the Grand Lake area. Snowmobiling also contributes significantly (although indirectly) to other sources of income in Grand Lake (lodging, retail sales, restaurants). For example, retail sales were equal to \$2.7 million in the town of Grand Lake from October 1999 to April 2000. This is a 237% increase when compared to retail sales from October 1989 to April 1990, and is due to increases in winter tourism, specifically snowmobiling.

3.2.2 Visitor Use

Humans have visited the land within the boundaries of RMNP for over 11,000 years. The first visitors were in search of game and followed game trails that led over the Continental Divide. It was not until the mid-1800's that early explorers of European descent began to visit the area, and it was not until the late-1800's that the area was first homesteaded.

Visitors have been coming to the area that is now RMNP for recreational purposes for over 100 years. When the park was established in 1915, the park had only 13,000 visitors. Since 1994, visitation at RMNP has exceeded 3 million visitors a year. For the past decade, visitation has been increasing at about two percent per year. Overnight use in the backcountry is also increasing. In 1984 6,536-backcountry permits were issued. In 1998 about 8,344 permits were issued, which is a 28% increase.

Recreational activities occur over a large portion of the park throughout the year and can pose a threat to flora, fauna, air and water quality. Snowmobiling, cross-country skiing, and snowshoeing occur throughout the late fall, winter and early spring on the west side of the park. These activities occur on designated and/or groomed trails, or sometimes as dispersed activities for some skiers and snowshoers. Snowmobile activities are allowed only on Trail Ridge Road or on the North Supply Access Trail where impacts to vegetation and wildlife are kept to a minimum. Trail Ridge Road from the Timber Lake Trailhead parking lot to Milner Pass reverts to a backcountry motorized road for snowmobiles only during the winter months. This is the only place in the park where this occurs in a backcountry setting. If this section of Trail Ridge Road were closed to snowmobiles, this area would revert to non-motorized backcountry use, providing an enhanced backcountry experience for visitors who do not use snowmobiles.

Snowmobiles do impact vegetation off-road along Trail Ridge Road because of illegal travel (Jeff Connor, personal observation). Examples of vegetation damage when snowmobiles leave the road include broken branches on willow (*Salix* spp.) and sagebrush. Conifer seedlings and pole-sized trees in the Kawuneeche Valley have also been broken or their leaders severed.

Snowmobiles can be a hazardous form of recreation. The U.S. Consumer Product Safety Commission estimates that there are 110 deaths and 13,400 hospital emergency room treated injuries attributed to snowmobiles each year. Approximately 40% of the reported deaths resulted from colliding with trees, wires, bridges, and other vehicles. Deaths have also occurred when the snowmobile entered water, mostly when it was operating on ice and fell through.

Only a small number of snowmobile accidents occur annually in the park. There have been accidents between snowmobiles and automobiles in and outside the park in Grand County where snowmobiles cross or travel along a road. Most of the snowmobile accidents in RMNP do not involve automobiles. Following is a summary of snowmobile-related accidents in RMNP for the past five winters:

Winter 1999/2000:

- 12/28/99: A snowmobile/car accident on Trail Ridge Road just south of the Kawuneeche Visitor Center. Several snowmobiles were traveling south on Trail Ridge Road where it is closed to snowmobiles. One snowmobile slid on ice and struck a northbound minivan.
- 12/29/99: Single snowmobile accident on Trail Ridge Road at the Colorado River Trailhead. Operator lost control of the snowmobile and struck a tree.

- 1/3/00: A two-snowmobile accident on the North Supply Access Trail just south of Sun Valley Road near the NPS housing area. Two-opposing snowmobiles sideswiped each other.
- 1/23/00: A single snowmobile accident on the North Supply Access Trail adjacent to the Sun Valley Road, near the NPS housing area. The operator lost control of the snowmobile on an icy part of the trail and slid into a tree.
- 2/25/00: A single snowmobile accident on the North Supply Access Trail just north of the Columbine Lake Road. The operator hit a bump in the trail, became airborne and injured her back when she landed.

Winter 1998/1999:

- 12/30/98: Single snowmobile accident on Trail Ridge Road at the fifth switchback above the Timber Lake Trailhead. Operator lost control, hit a snow berm and was ejected.
- 1/1/99: Single snowmobile accident on the North Supply Access Trail just north of the Golf Course Road (County Road 48). The operator struck a slightly exposed manhole cover at a high rate of speed and rolled the snowmobile.
- 2/3/99: A two-snowmobile accident on Trail Ridge Road at the Bowen/Baker Trailhead. One-snowmobile slid into another.

Winter 1997/1998:

- 1/12/98: Single snowmobile accident on Trail Ridge Road at the Timber Lake Trailhead. Operator failed to make a turn and struck a snow berm.
- 2/13/98: Single snowmobile accident on the North Supply Access Trail, just south of Sun Valley Road. Operator lost control of the snowmobile and struck a tree.
- 2/18/98: Single snowmobile accident on Trail Ridge Road at the Green Mountain Trailhead. An NPS snowmobile operator struck a snow berm and rolled the snowmobile.

Winter 1996/1997:

- 12/28/96: Single snowmobile accident on Trail Ridge Road at the first switchback. Operator was driving too fast, hit a bump, ejecting his passenger.
- 12/29/96: Single snowmobile accident on Trail Ridge Road at Timber Creek Campground. Operator lost control of the snowmobile and struck a snow berm.
- 2/13/97: A van struck a snowmobile on Columbine Lake Road as a snowmobile operator tried to cross the road while traveling along the North Supply Access Trail.

Winter 1995/1996:

- No accidents (note – this was the winter of the government shut down with subsequent park closures).

Ten of the 14 accidents (71%) have involved single snowmobiles and only two have been between snowmobiles and automobiles. One auto/snowmobile accident occurred on the Columbine Lake Road and the other on Trail Ridge Road.

Because of the potential for auto/snowmobile conflicts, snowmobiles are currently required to access Trail Ridge Road via the North Supply Access Trail. Also, because of potential auto/snowmobile conflicts the road shoulder on the Sun Valley Road has recently been widened to more safely accommodate snowmobiles.

Trail Ridge Road east of the Kawuneeche Visitor Center is maintained as a snowpacked road with about 3 in. (8 cm) of snow remaining on the road. This tends to keep automobile traffic slower and also minimizes problems between automobiles and snowmobiles along the 10 mi. (16 km) of road that is designated dual-use. The posted speed limit along Trail Ridge Road for automobiles and snowmobiles is 35 mph (60 km/h). 36 CFR §7.7(e) for RMNP lists the speed limit at 25 mph (40 km/h) for dual use roads, but the park lists in its compendium 35 mph pending revision of 36 CFR §7.7(e). The speed limit listed in 36 CFR §7.7(e) will eventually be changed based on the outcome of this EA. The speed limit along the North Supply Access Trail is posted at 25 mph (40 km/h), which includes the dual use portion of the Sun Valley Road where automobiles are also required to travel at 25 mph (40 km/h).

3.2.3 Public Enjoyment

In addition to air pollution and conflicts with wildlife, another potential impact is noise pollution. Many visitors who come to RMNP in the winter are seeking solitude, serenity and tranquility (RMNP Visitor Use Survey 1996). See Section 3.1.3 (page 33) for further details about the visitor use survey. Snowmobiles can negatively impact the experience of park visitors who are seeking to get away from our increasingly noisy and hectic society.

3.2.4 State, Tribal and Federal Authority

Managing snowmobiles in RMNP does not change the authority of local, state, tribal or other federal agencies as defined by law.

3.2.5 Park Programs and Budget

The park's operating funds are used for managing snowmobiles. Snowmobile users utilizing Trail Ridge Road are required to pay a \$5.00 entrance fee, and under the Fee Demonstration Program the park keeps 80% (\$4.00). They either pay at the entrance station by placing the money in a fee collection box or pay at the Kawuneeche Visitor Center. Since the entrance stations are not staffed during the winter, the entrance fee is based on the honor system. Periodic compliance checks by park rangers indicate that about 50% to 60% of visitors entering the Colorado River District during the winter pay the entrance fee. Snowmobile users are not required to pay an entrance fee when using the North Supply Access Trail since they are only passing through the park in order to

access the nearby Stillwater Trail OHV System. Based on about 4,300 snowmobiles entering the park per year and 50% to 60% of them paying the entrance fee, the park generates about \$10,750 to \$12,900 and keeps about \$8,600 to \$10,320.

In the past, three NPS rangers managed snowmobile use during the winter. In 1999 one additional permanent ranger position was funded, in part to assist with the management of snowmobiles and the enforcement of snowmobile-related regulations. The North Supply Access Trail is groomed by a private non-profit organization that is largely funded by donations and grant money. RMNP equipment and personnel are used to plow Trail Ridge Road to the Timber Lake Trailhead parking lot. This portion of Trail Ridge Road serves as a dual use road for snowmobiles and automobiles with 3 in. (8 cm) of packed snow. Because of packed snow from snowmobile use, plowing Trail Ridge Road from the Timber Lake Trailhead to Milner Pass in the spring takes more time and money than if the road was not open to snowmobiles (1980 RMNP Snowmobile EA).

3.3 CULTURAL RESOURCES

RMNP is known mainly for its scenic beauty and wildlife. However, like many other “natural” parks, cultural resources are also important.

To date, 816 prehistoric and historic archeological sites have been identified in the park (Bill Butler, personal communication). The park's Cultural and Natural Resources Management Plan was updated in 1998. This plan includes detailed information regarding historic and prehistoric resources, and defines requirements and management direction for cultural resource preservation. A copy of the plan is available for review at the RMNP library and the Estes Park Public Library.

3.3.1 Historic Resources

Historic resources relate to mining, ranching, logging, tourist activities, and to facilities associated with development of the park. Mining, ranching, logging and most facilities that predated the establishment of the park have been removed from the park. Many areas disturbed from the mid-1800's to the turn of the century have been restored to natural conditions.

Historic use of the park resulted in significant impacts to native plants and animals. Disturbance activities allowed the introduction of exotic plants, which has a direct impact on native plants and animals.

3.3.2 Prehistoric Resources

Park archeological resources, related primarily to Native American sites, date back 11,000 to 15,000 years. The Ute Trail provided a route across the Continental Divide for both Ute and Arapaho tribes, as did the Flattop Mountain Trail and the Fall River Trail. Evidence collected from the Ute Trail indicates human use of the trail dates back 8,000 years.

Various archeological surveys have identified aboriginal sites and trails. The work of archeologists suggests that the earliest occupation of the park was between 10,000 and 15,000 years ago, and from at least 9,000 years ago and onward there was continuous use of the area (Husted, 1959).

To date, of the 265,354 acres (107,430 ha) in the park, about 27,754 acres (11,232 ha) have been surveyed for prehistoric or historic archeological sites. Further archeological survey work was completed during the summers of 1998, 1999 and 2000 (Brunswig 1999, 2000). Less than 820 archeological resources have been recorded in the park's 84 year history due to very limited and sporadic research up until 1998 when funds became available for more extensive survey work. Few of the recorded sites have been evaluated for National Register status. The documentation of historic sites has fared somewhat better with approximately 272 of the park's 454 structures having been evaluated.

Section 4. ENVIRONMENTAL CONSEQUENCES

Introduction

This section is organized by resource topic (air, vegetation, water, etc.), and the consequences (impacts and effects) of each of the alternatives are analyzed and compared under each resource topic.

Environmental consequences topics are selected on the basis of significant park resources and the potential for beneficial or adverse effects on those resources by each alternative as required by law, regulation, and NPS policies. Environmental consequences may be direct, indirect, or cumulative. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later in time or farther removed from the place, but are still reasonably foreseeable. Cumulative effects are the effects on the environment that result from the incremental impact of the actions when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Congress directed in the 1978 Redwood Act that the NPS should carefully consider any unnatural impact to natural resources. Protection of natural and cultural resources from human disturbances related to snowmobiles is fundamental to the park's 1976 Master Plan, NPS policies and guidelines and Executive Orders 11644 and 11989 (36 CFR 2.18).

Alternative 1 (the preferred alternative) proposes leaving the North Supply Access Trail open to snowmobiles but closing Trail Ridge Road, the Summerland Park Snowmobile Trail and the Bowen Gulch Access Route. Trail Ridge Road would remain open to automobiles from the park boundary to the Timber Lake Trailhead parking lot. This alternative minimizes the impacts to natural and cultural resources from snowmobiles and encompasses the allocation of some resources which is still consistent with the park's purpose and significance and Executive Orders 11644 and 11989 and the exception identified in the April 26, 2000 memorandum from the Department of the Interior Assistant Secretary for Fish and Wildlife and Parks.

There is general agreement between the NPS and the businesses in Grand Lake that some visitors who want to rent a snowmobile and drive on Trail Ridge Road will no longer do so if Trail Ridge Road is closed to snowmobiles. A private contractor, Research Triangle Institute (RTI) completed an analysis of the preferred alternative in a November 2000 report. It is anticipated that some visitors who may have rented a snowmobile and driven on Trail Ridge Road will do other activities in the Park and Grand Lake area, and others may not visit and would go elsewhere. An average of 4,690 snowmobiles used Trail Ridge Road in the winters of 1996-1997, 1997-1998, and 1998-1999. There was an average of 1.45 visitors per snowmobile for a total of 6,800 visitors. RTI assumed that 90% of snowmobile users that drive on Trail Ridge Road rent snowmobiles.

The preferred alternative will cause a shift of snowmobiles that would have used Trail Ridge Road, to the North Supply Access Trail. The USFS believes an increase in snowmobiles along the North Supply Access Trail and the Stillwater Trail System will have a direct impact to user safety and experience, and potential indirect and cumulative impacts on soil and vegetation, air quality, noise, aquatic wetland and riparian communities, wildlife and potential lynx and wolverine habitat) on the Arapaho National Forest.

The increased impacts on the Arapaho National Forest from more snowmobiles are difficult to quantify because the total number of snowmobiles that enter the Stillwater Trail System from the Idleglen Parking Area is not accurately known. A snowmobile counter was placed near the Idleglen parking area that collected data for five years. In 1999-2000, 24,000 snowmobiles passed by the counter. RMNP has information on the number of snowmobiles that used the North Supply Access Trail and estimated that 24,117 snowmobiles in 1999-2000 passed through the park. The total number of snowmobiles that used the Stillwater Trail System in 1999-2000 could have been as high as 48,000. If under the worst case scenario that all snowmobiles that ride on Trail Ridge Road (an average of 4,690) shift to the Stillwater Trail System, there would be about a 9% increase.

More snowmobile traffic along the North Supply Access Trail is not expected to compromise safety. During the past five years, 121,000 snowmobiles have used the North Supply Access Trail, and seven (7) snowmobiles have been involved in accidents during that time. The accident rate during that time was 0.06 per 1000 trips. Statistically, an additional 4,300 trips would lead to one (1) additional accident every four (4) years along the North Supply Access Trail.

Alternative 2 (no action) proposes leaving the North Supply Access Trail and Trail Ridge Road open to snowmobiles, but permanently closing the Summerland Park Snowmobile Trail and the Bowen Gulch Access Route. This alternative continues to allow snowmobiles on Trail Ridge Road, which is inconsistent with preserving and protecting natural and cultural resources and Executive Orders 11644 and 11989. There are no exceptions in Executive Orders 11644 or 11989 that allow snowmobiles to travel 16 mi. (25.6 km) into the interior of the park solely for recreational purposes if the use causes adverse impacts to park resources.

Alternative 3 (less restrictive) proposes leaving the North Supply Access Trail, Trail Ridge Road, Summerland Park Snowmobile Trail and the Bowen Gulch Access Route open to snowmobiles. This alternative continues to allow snowmobiles on Trail Ridge Road and reopens the Summerland Park Snowmobile Trail and Bowen Gulch Access Route, which is inconsistent with preserving and protecting natural and cultural resources.

Alternative 4 (most restrictive) proposes closing the park to snowmobiles. This alternative is consistent with the park's purpose and significance and has the least environmental impact on the park itself, but imposes potential public safety risks and

potential environmental impacts on public and private lands outside the park. In addition, this alternative does not take advantage of the exception addressed in the April 26, 2000 memorandum.

Regardless which alternative is selected, RMNP would continue to use snowmobiles within the park for administrative purposes. NPS administrative use of snowmobiles will be restricted to that required to manage public use of snowmobile routes and areas where and if authorized, to conduct emergency operations, and to accomplish essential maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means.

4.1 IMPACT ON NATURAL RESOURCES FROM THE ALTERNATIVES

Given the park's mandate to protect natural and cultural resources and provide for the benefit and enjoyment of the people of the United States, the alternative chosen should be the most sensitive towards protection of natural resources while having the greatest long-term beneficial effect on these resources and park visitors consistent with the act establishing RMNP. Director's Order #55 makes it clear that the preservation of the resources is paramount, and the provision of enjoyment to visitors is secondary. However, the 1915 Act establishing RMNP also directs the freest use of the park by visitors. The 1976 Master Plan for RMNP recognizes humans, where present, as part of the park's ecosystem, but the major emphasis is on the perpetuation of natural processes.

4.1.1 Impact on Soils and Vegetation

The small study conducted by VanMouwerik (2000) revealed that contaminants from snowmobile emissions are occurring along the North Supply Access Trail in snow and possibly in soil and sediment. However, the small sample size does not provide a direct link between soil and sediment contamination and snowmobile use. Additional sampling and analysis would be needed before a determination can be made on what impact snowmobiles are having on soils or sediments. The data that is currently available does not indicate that continued use of snowmobiles along the North Supply Access Trail as described in Alternative 1 and Alternative 2 will have a significant adverse impact on soils or vegetation. However, the open meadow of Kawuneeche Valley is conducive to illegal off-road travel and snowmobiles have impacted vegetation.

If Alternative 1 is selected it will eliminate any possible impacts to soils, vegetation or wetlands caused by snowmobile use along Trail Ridge Road. Even though snowmobile use on Trail Ridge Road will likely shift to the North Supply Access Trail, the impact to vegetation will be minimal because fencing and/or dense lodgepole pine and dead and down trees make off-road travel difficult. The North Supply Access Trail follows a utility right-of-way corridor for the first 1.4 mi. in the park. Once snowmobiles reach the Sun Valley Road the chance for illegal off-road travel increases because the road is adjacent to Harbison Meadow. Some buck-'n'-rail fencing and signs have been used along the road to help keep snowmobiles from traveling off-road. Illegal off-road travel along the North Supply Access

Trail has not been a serious problem, but it does occur occasionally (Bob Love, personal communication).

Regardless of which alternative is implemented, maintenance of Trail Ridge Road from the park boundary to the Timber Lake Trailhead during the winter will probably not change to any great degree. Presently the road is plowed leaving about 3 in. (8 cm) of packed snow on the road. The snowpacked road allows snowmobiles and automobiles to share the road. If Trail Ridge Road is closed to snowmobiles (Alternatives 1 and 4), the road may on occasion be plowed to pavement, but the preference is to leave the road snowpacked from the Kawuneeche Visitor Center to the Timber Lake Trailhead because it is more cost efficient, safer, and will have less environmental impacts. The road has been plowed to pavement in the past, which presented long-term maintenance problems due to excessive wear on snow removal machinery and road wear (Doug Buttery, personal communication). Plowing to pavement also caused an increase in accidents because of ice forming on the pavement, and vehicles had a tendency to travel at a higher rate of speed (Bob Love, personal communication).

If the road was plowed to pavement, the Facilities Management Division in RMNP would propose using a product called Ice Ban®, or a comparable deicer, to reduce ice buildup on the road. Ice Ban® is mixed at a ratio of 3.8 gallons per ton of sand. Ice Ban® is a liquid concentrate that is a byproduct of the wet milling of corn and the production of alcohol. A Material Safety Data Sheet (MSDS) for Ice Ban® can be found in Appendix III. Because Ice Ban® is a natural byproduct, it is not expected to cause any negative impacts to soils, vegetation, water bodies, wetlands or wildlife. However, because Ice Ban® is a relatively new product, it is not known if long-term use will result in cumulative, and as yet unidentified, impacts.

By constantly plowing the road to pavement, the Facilities Management Division estimates the park would have to use about 200 tons of sand and about 760 gallons of Ice Ban®, or a comparable product, per winter on Trail Ridge Road from the park boundary to the Timber Lake Trailhead parking lot. By maintaining the road as a snowpacked road, the use of sand and Ice Ban® will be kept to a minimum and may not be used at all during the winter. If the road was plowed to pavement and the estimated quantities of sand and Ice Ban® were used along Trail Ridge Road, adverse impacts to riparian areas in Kawuneeche Valley is possible. Currently salt on vehicles is attracting moose to parking lots, which is a safety concern for the moose and for park visitors. Salt on vehicles is caused from vehicles driving on roads outside the park, but if Ice Ban® was used frequently in the park, it would exacerbate the current problem.

Sand that is spread on the road to improve traction is of greater concern than the use of Ice Ban®. Sand eventually gets washed into drainages and can impact riparian vegetation or cover adjacent roadside vegetation. The only way to minimize impacts to riparian areas would be to remove the sand in the spring after the snow melts. Doing so would be a time consuming and costly endeavor. A program to monitor adjacent aquatic systems will be necessary if a significant amount of sand and Ice Ban® is used along Trail Ridge Road.

If Alternative 2 is selected, impacts to vegetation and soil along the edge of Trail Ridge Road from illegal off-road snowmobile travel could still occur. Alternative 2 would allow snowmobiles to travel 16 mi. (25.6 km) into the park, which has the potential for the greatest long-term impact to vegetation within the interior of the park. Trail Ridge Road would be maintained as a snowpacked road, eliminating or minimizing the need for sand and Ice Ban®.

Alternative 3 will have the largest impact on soil and vegetation. Besides allowing the continued use of Trail Ridge Road for snowmobiles, the Summerland Park Snowmobile Trail and Bowen Gulch Access Route would be reopened to snowmobiles. This will significantly increase the chances of off-road vegetation and soil impacts. One of the reasons the Summerland Park Snowmobile Trail was closed was because of snowmobiles traveling off-road and impacting adjacent vegetation. The Summerland Park Snowmobile Trail and Bowen Gulch Access Route also traverse through riparian areas, and impacts to sensitive riparian soil and vegetation is expected. The Bowen Gulch Access Route ends at the USFS Never Summer Wilderness and occasional illegal entry into wilderness may occur. The USFS would have some concerns due to illegal off-road travel in the Never Summer Wilderness if the Bowen Gulch Access Route was reopened to snowmobiles (Bill Dunkelberger, personal communication). Trail Ridge Road will be maintained as a snowpacked road, minimizing the use of sand and Ice Ban®.

Because Alternative 4 eliminates public use of snowmobiles within RMNP, it will eliminate future impacts to soil and vegetation from public snowmobile use in the park. Trail Ridge Road will be maintained as a snowpacked road as discussed in Alternative 1, which will minimize the use of sand and Ice Ban®. Alternative 4 would cause additional impacts to USFS administered land. For example, the Idleglen parking area probably would have to be enlarged, which would impact USFS lands and natural resources.

4.1.2 Impact on Natural Sound and Night Sky

Snowmobiles can have a negative effect on the natural soundscape because of the design of their two-stroke engines, which are generally noisier than automobiles. This noise may be especially disturbing to wildlife (Walter and Garrett 1981 cited in Oliff et al. 1999).

Natural sound, solitude, space and natural light are considered important resources in the park and they can be negatively impacted by human activities. These attributes are also important to wildlife.

Alternative 1 will reduce snowmobile and associated noise impacts from the interior of the park. Studies in Yellowstone National Park indicate that snowmobiles can be heard two to three miles away from a road corridor, while automobiles can be heard usually no further than one mile at best (Karl Cordova, personal communication). The sound of snowmobiles utilizing the approved trails on USFS land adjacent to the park can be heard in some park areas in the Kawuneeche Valley and this noise would continue. Noise impacts would continue in the vicinity of the North Supply Access Trail. The anticipated shift of snowmobiles from Trail Ridge Road to the North Supply Access Trail will cause some

increase in noise along the trail, but this is considered to be a minor increase. Snowplows maintaining the snowpacked Trail Ridge Road will still be heard throughout the Kawuneeche Valley. This noise has been ongoing since the road was built. Maintaining Trail Ridge road as a snowpacked road will be less of a noise intrusion than if it is plowed to pavement. The snowplows would have to work harder to plow to pavement and plowing directly on the pavement is louder than plowing on a snowpacked road.

Natural quiet will be restored to the area that extends from the Timber Lake Trailhead parking lot to Milner Pass. Snowmobile noise will not pierce the peacefulness of winter, which will restore natural quiet to the interior of the park. The visitors that enter the Grand Lake Entrance on Trail Ridge Road during the winter will experience more natural sounds if snowmobiles are no longer permitted to travel on the road.

Skiers and snowshoers that access trails from Trail Ridge Road will have an enhanced experience with the elimination of snowmobiles from the road. The trail from the Timber Lake parking lot to LuLu City and the trail to Timber Lake are popular for skiing and snowshoeing. Trail Ridge Road is elevated above the hiking trail to LuLu City for about 1 mi. (1.6 km) before turning towards Far View Curve just above Lost Creek. At the present time noise from snowmobiles can be heard from both trails until snowmobiles pass Far View Curve. Natural sound will be restored to these two trails if Alternative 1 is selected.

If Alternative 2 is selected, impacts to the natural soundscape would continue to occur along Trail Ridge Road and in the Kawuneeche Valley from the Kawuneeche Visitor Center to Milner Pass. The sound of snowplows will remain unchanged.

Alternative 3 would increase snowmobile noise in the park because the Summerland Park Snowmobile Trail and Bowen Gulch Access Route would be reopened. Currently the road to Summerland Park is closed to motorized vehicles during the winter. There are two privately owned inholdings in Summerland Park and the owners are allowed to drive to their properties during the summer. The inholdings in Summerland Park are the only private properties within the park that can claim the snowmobile access exception that was stated in the April 26, 2000 memorandum. The owners can access their properties during the winter by snowmobiles and use of snowmobiles by private landowners will be handled administratively.

Because Alternative 4 eliminates public use of snowmobiles within RMNP, it will eliminate future noise impacts from public snowmobile use in the park. Snowmobiles using the Stillwater Trail OHV System adjacent to the park would still be heard in some park areas. The sound of snowplows will still be heard along Trail Ridge Road from the park boundary to the Timber Lake Trailhead.

4.1.3 Impact on Aquatic, Wetland and Riparian Communities, and Floodplains

Emissions from two-stroke snowmobile engines can settle onto the snow in the vicinity of snowmobile trails and can be incorporated into the snowpack. As the snow melts in

the spring these pollutants can be carried into park streams and ponds, with possible adverse effects on water quality and aquatic biota including macroinvertebrates (Ruzyski and Lutch 1999).

A review of the literature on snowmobile emissions reveals that snowmobile exhaust includes methyl tertiary butyl ether (MTBE) and polycyclic aromatic hydrocarbons (PAHs) and possibly sulfate and ammonium as the greatest potential threats to water quality in areas of high snowmobile use (Hagemann and VanMouwerik 1999). As discussed in section 3.1.4 (page 35) VanMouwerik (2000) found PAH levels higher than background levels in snow, probably higher than background in soil, and possibly higher than background in pond water and sediment along the North Supply Access Trail. MTBE is presently banned in gasoline in Colorado but as VanMouwerik (2000) stated it is still considered a threat. Adams (1975) found lead and hydrocarbons in the water of a pond in Maine from snowmobile exhaust one-week following ice-out. Lead is no longer added to gasoline and should not be found in any vehicle exhaust. Ingersoll (1999) found that concentrations of ammonium were up to three times higher in snow samples collected on snowpacked roadways used by snowmobiles when compared to off-road snow samples in Yellowstone National Park. Concentrations of ammonium decreased rapidly with distance from the road. In addition, concentrations of ammonium, nitrate, sulfate, benzene, and toluene in snow were positively correlated with snowmobile use.

Protection of park aquatic resources and restoration of native species are primary management goals of the NPS. In RMNP the portion of Trail Ridge Road open to snowmobiles is adjacent to the largest wetland habitat in the park (portions of the Kawuneeche Valley). The North Fork of the Colorado River passes through the valley and the portion of Trail Ridge Road open to snowmobiles crosses over six major tributary streams of the river. Hydrocarbon pollution deposited on snow on or adjacent to Trail Ridge Road could quite possibly enter the aquatic system of the valley. Investigations have shown dramatic increases in some contaminants in water exposed to snowmobile exhaust (Adams 1974).

Within the park, the North Supply Access Trail passes a pond, some riparian areas and then crosses over the North Fork of the Colorado River at the park boundary. The small study conducted by VanMouwerik (2000) did find contaminants from snowmobile emissions in snow, probably soil and possibly in the pond but it was not clear if river water and sediment from the river was contaminated. None of the samples were extremely contaminated and only a possible moderate adverse effect was noted. The small sample size did not provide enough data to provide a direct link between contamination and snowmobile use. Additional sampling and analysis would be needed before a conclusion can be reached that snowmobile use is having any adverse impact on aquatic resources or soils. The data that is currently available does not indicate that continued use of snowmobiles along the North Supply Access Trail will have a significant adverse impact on the long-term natural and beneficial values of aquatic, wetland, riparian communities and floodplains.

There is an unknown risk to wetland and riparian communities along Trail Ridge Road if the road was plowed to pavement and sand and Ice Ban®, or a comparable product, are used to

improve traction and prevent the build up of ice. However, it is the preference of RMNP staff to maintain the snowpacked road which will minimize the need for sand and Ice Ban® and thus minimize adverse impacts to aquatic systems.

If Trail Ridge Road is closed to snowmobiles as proposed in Alternative 1, it is anticipated that some visitors that would have driven a snowmobile on Trail Ridge Road will shift to the North Supply Access Trail. The increased use on the North Supply Access Trail is currently difficult to predict, but an increase in snowmobile emissions along the trail is possible. Under the worst case scenario on average 4,690 more snowmobiles would drive along the North Supply Access Trail, which would be about a 14% increase in use based on 28,417 snowmobiles entering RMNP in 1999/2000. However, given the data that is currently available, it does not appear that increased use along the North Supply Access Trail will result in significant impacts to aquatic, wetland or riparian habitat. Monitoring similar to the work by VanMouwerik (2000) will continue along the North Supply Access Trail to assess impacts to aquatic communities. If new data reveals that significant impacts are occurring, the park will reevaluate snowmobile use.

Alternative 2 has a high risk of impacts to aquatic, wetland and riparian communities from snowmobiles traveling along the edge of the Kawuneeche Valley. The portion of Trail Ridge Road that would be open to snowmobiles crosses six tributary streams of the North Fork of the Colorado River and runs along the edge of the Kawuneeche Valley for about 10 mi. (16 km). Snow and ice melting from the road and adjacent road shoulders has the potential to introduce snowmobile pollutants into aquatic, wetland and riparian communities. If Alternative 2 is selected, monitoring similar to the work by VanMouwerik (2000) will continue along the North Supply Access Trail and Trail Ridge Road to assess impacts to aquatic communities. If new data reveals that significant impacts are occurring, the park will reevaluate snowmobile use.

Alternative 3 has the highest risk of impacting aquatic, wetland and riparian communities from snowmobiles because they travel along the edge of the Kawuneeche Valley for 10 miles and also because the Summerland Park Snowmobile Trail and Bowen Gulch Access Route cross wetland habitat. The Bowen Gulch Access Route crosses through riparian habitat in Kawuneeche Valley. This access route will have a high risk of impacting aquatic systems in and near the trail if it is reopened to snowmobiles. The same adverse impacts could occur in wetland habitat where the Summerland Park Snowmobile Trail passes through or by wetland habitat. If Alternative 3 is selected, monitoring would be required along Trail Ridge Road, the Summerland Park Snowmobile Trail and the Bowen Gulch Access Route. If new data reveals that significant impacts are occurring, the park will reevaluate snowmobile use.

Because Alternative 4 eliminates public use of snowmobiles within RMNP, it will eliminate future impacts to aquatic, wetland and riparian communities from public snowmobile use within the park itself. No monitoring would be necessary within the park.

4.1.4 Impact on Endangered, Threatened and Rare Species

Human disturbance of carnivores, such as the lynx and wolverine, is of concern during the winter. These two animals are particularly sensitive to humans and tend to move away from human disturbed areas (Buskirk and Ruggiero 1994). However, these two species are not currently known to be present in RMNP and none of the alternatives will have an adverse impact on these species at this time. Implementing the preferred alternative will benefit lynx and wolverine potential habitat as well as big horn sheep winter range near Milner Pass and black bear den habitat in the same vicinity.

Even though the alternatives have different risks, implementing Alternative 4 will probably be the most beneficial for threatened, endangered or rare flora and fauna within the Colorado River District of Rocky Mountain National Park. However, there is a concern that closing the park to snowmobiles will result in more snowmobile travel on Shadow Mountain Lake. This could have a negative impact on wintering bald eagles below the Shadow Mountain Lake dam. Eagles could be affected if snowmobiles illegally enter the closed area or through increased noise from snowmobiles traveling along the edge of the closed area. Keeping the North Supply Access Trail open will help to keep snowmobiles off Shadow Mountain Lake, which will help to protect wintering bald eagles. When environmental impacts beyond the borders of the park are considered, Alternative 1 will have less impact on bald eagles than Alternative 4.

The park's Master Plan, NPS guidelines and policies, and Executive Orders 11644 and 11989 all dictate preserving and protecting native flora and fauna and preventing the extirpation of native species whenever possible.

See Appendix I for a complete list of endangered, threatened and rare species known to occur in RMNP. The Endangered Species Act requires the NPS to determine whether an action would affect federally listed endangered or threatened species. It is well within the spirit of the Endangered Species Act that the NPS also protect candidate species, and state-listed endangered, threatened and species of concern, to prevent any future listing.

AMPHIBIANS

The wood frog is considered to be vulnerable in Colorado. It occurs in riparian areas in the Kawuneeche Valley. The long-term consequences of snowmobiles on this frog are unknown. The potential will still exist for snowmobile pollutants to impact the wood frog with the implementation of Alternative 2 and especially Alternative 3. The Summerland Park Snowmobile Trail and the Bowen Gulch Access Route pass through or by wood frog habitat. Because of the potential impact to riparian habitat along Trail Ridge Road from snowmobiles, the frog should benefit from maintaining packed snow on Trail Ridge Road. Minimizing sand and Ice Ban® as proposed in the Alternatives will protect the wood frog and its habitat. The preferred alternative will be a benefit to wood frog habitat.

BIRDS

The bald eagle, which is Federally listed as a threatened species, and the Northern goshawk, which is considered to be vulnerable in Colorado, are the only birds of concern that occur in the Colorado River District during the winter months. Northern goshawks hunt throughout the Kawuneeche Valley and surrounding forested areas. During the winter they forage over large areas and probably are not disturbed by vehicular traffic along Trail Ridge Road, but the elimination of noisy snowmobiles from the interior of the park as discussed in Alternative 1 or 4 should be a benefit. During the colder months of the year when snowmobiles are in use, the Northern goshawk may leave the park, to winter in lower elevation areas or more southern areas of the country.

Bald eagle winter habitat is generally associated with areas of open water (unfrozen portions of lakes and free-flowing rivers) where fish and/or waterfowl congregate (Stangl 1999). The best habitat in RMNP is along the open water of the North Fork of the Colorado River below Shadow Mountain Lake dam and above Columbine Bay. This is the area where the USFS and the NPS maintain a bald eagle closure.

Eagles will forage on high-quality food away from open water in particular upland areas where ungulate carrion, game birds and *lagomorphs* are available. They occasionally forage in the Kawuneeche Valley during the winter and should benefit from the elimination of snowmobiles along Trail Ridge Road if Alternative 1 or 4 is implemented. There will be no change to any potential impact to bald eagles with the implementation of Alternative 2, but increased impacts are possible if Alternative 3 is implemented. Closing the North Supply Access Trail as discussed in Alternative 4 may cause an increase in snowmobile traffic on Shadow Mountain Lake and consequently could result in impacts to eagles in the closed area. Since the prime bald eagle winter habitat is closed to snowmobiles, keeping the North Supply Access Trail open as discussed in Alternatives 1 and 2 will have a minimal impact on them.

Snowmobiles may be especially disturbing to bald eagles because of associated random movement, loud noise, and operators who are generally exposed (Stangl 1999). Automobiles appear to have less of an impact on bald eagles (Stangl 1999). Prime bald eagle habitat in RMNP and USFS land is closed to the general public during the winter and spring which includes skiing and snowshoeing. Skiing, snowshoeing and pedestrian activities can displace bald eagles, especially when the activities occur outside of predictable use areas. These activities may have a greater impact on eagles foraging for fish or ungulate carcasses (Anthony et al. 1995). Management of bald eagle winter and spring habitat should be free from human harassment. The USFS and NPS are presently doing this with the seasonal closure in prime bald eagle winter/spring habitat.

FISH

The Colorado River cutthroat and the mountain sucker are species of concern in Colorado. Both species occur in the North Fork of the Colorado River and tributary streams. These fish are an important component of the aquatic ecosystem found in the

Kawuneeche Valley and associated tributary streams. There is a concern that the discharge of snowmobile exhaust directly into accumulated snow may be a source of pollution that can lead to a cumulative long-term negative impact to these species, although this has not yet been studied in the Kawuneeche Valley. Hydrocarbon pollution may initially persist on the surface of the water when snow and ice melt in the spring, but may eventually settle into the water column increasing exposure to fish and invertebrates. Investigations have shown dramatic increases in some contaminants in water exposed to snowmobile exhaust; some of these increases are on the order of 30 times (Adams 1974, cited in Ruzycik and Lutch 1999).

Alternatives 1 and 4 will eliminate any potential snowmobile impacts to aquatic resources in much of the Kawuneeche Valley, which would benefit the Colorado River cutthroat and mountain sucker. Impacts will remain unchanged in the short-term and cumulative impacts could increase in the long-term if Alternative 2 or 3 is adopted and the number of snowmobiles that enter the park along Trail Ridge Road continues to increase. Alternative 3 has a greater chance of impacting these fish because of reopening the Summerland Park Snowmobile Trail and Bowen Gulch Access Route. Because of unknown long-term cumulative impacts from the use of sand and Ice Ban®, the road will be maintained with packed snow regardless of which alternative is chosen, which will minimize impacts from these two products.

MAMMALS

The river otter is listed as endangered in the state of Colorado. It is common in the Kawuneeche Valley and should benefit from the elimination of snowmobiles on Trail Ridge Road. Otters are commonly found in the North Fork of the Colorado River and most of the tributary streams.

The park and CDOW are considering the reintroduction of wolverine into the park (Seidel et al. 1998). The wolverine is a candidate species for Federal listing as a threatened or endangered species. However, because of the ongoing lynx reintroduction program, any reintroduction of the wolverine has been put on hold. If a reintroduction were to move forward, RMNP would first prepare an EA for public review and comment. Presently, there is no confirmation of relic wolverine in the park and it is believed that the wolverine has been extirpated. Extensive surveys in the past nine years have not found any evidence of the animal. Wolverine habitat would benefit from the implementation of Alternative 1 or 4. If Alternative 1 or 4 is implemented, no winter vehicular traffic will be allowed above the Timber Lake parking lot, which would return six miles of Trail Ridge Road to more natural conditions. Skiers and snowshoers will still be allowed along Trail Ridge Road, but their impact on wildlife is expected be less than a snowmobile. Wolverine habitat will be enhanced if snowmobiles are no longer permitted to travel the length of the Kawuneeche Valley.

Presently, no known relic lynx exist in RMNP. The lynx is Federally listed as a threatened species. Two radio-collared lynx that were reintroduced into the state of Colorado by CDOW traveled north from their release site and have spent some time in RMNP in the

Kawuneeche Valley area. Both animals eventually left the park, but if one or more lynx did become established in the park in the future, the NPS would consider supplementing it with a few more in hopes of establishing a breeding population. The lynx would benefit if Alternative 1 or 4 is implemented, and habitat in the Kawuneeche Valley area and above the Timber Lake Trailhead parking lot would become more conducive to the lynx during the winter months.

Impacts to the river otter and its habitat, and wolverine and lynx habitat would remain unchanged in the short-term if Alternative 2 was implemented, but could increase if more snowmobiles use Trail Ridge Road. Alternative 3 could increase impacts to river otter and potential wolverine and lynx habitat. Snowmobiles could be part of a cumulative recreational impact to the wolverine, lynx, river otter and their habitat as visitor use increases.

INVERTEBRATES (INSECTS)

There are no known endangered, threatened or rare insects that will be impacted by implementing any of the alternatives.

MOLLUSKS

There are no known endangered, threatened or rare mollusks that will be impacted by implementing any of the alternatives.

PLANTS

Middle Park Penstemon (*Penstemon cyathophorus*) was historically known to occur near Trail Ridge Road in the Colorado River District. However, it is presently unknown if the plant still exists in the park. One historic record indicates it was along a portion of Trail Ridge Road that is presently closed to snowmobiles, but open to automobiles. The elimination of snowmobiles along Trail Ridge Road as discussed in Alternatives 1 or 4 will eliminate any impact to potential habitat. Minimizing the use of sand and Ice Ban® will benefit the species since the historic known location was close to Trail Ridge Road.

4.1.5 Impact on Wildlife other than Endangered, Threatened or Rare Species

Increasing numbers of humans in RMNP may prevent some wildlife species from taking advantage of foraging opportunities within their home ranges, even where habitat remains intact. Green (1994), for example, found that roads and traffic in Yellowstone may diminish or prevent bear use of some winter-killed ungulate carcasses. During the winter, many animals reduce their activity and therefore energy expenditure to compensate for reduced energy intake, a result of limited quantity and quality of available forage (Telfer and Kelsall 1984). Trail Ridge Road from the Timber Lake Trailhead parking lot to Milner Pass reverts to a backcountry motorized road for snowmobiles only during the winter, which has an impact on wildlife. Closing the road to snowmobiles will revert the road to a non-motorized

backcountry trail which will benefit, big horn sheep winter range and black bear den habitat in the Milner Pass area.

Aune (1981) found that elk, bison, mule deer, and moose in Yellowstone National Park developed crepuscular activity patterns and showed altered patterns of movement and habitat use in response to winter recreationists. Behavioral and physiological responses to continuing harassment in the form of noise or certain types of human presence can shift an animal's energy balance so that more is expended than is taken in, which results in decreased survival or reproduction success (Anderson 1995).

RMNP is concerned about the effect that winter recreation may be having on the natural environment, including wildlife. Winter is the time of highest wildlife mortality and the most stressful time of the year for native wildlife. Human activities continue to expand into wildlife habitats within the park. To minimize the impacts of these activities, park managers need to be aware of the effects of these activities and to understand how to mitigate them. Snowmobiles could potentially affect animals such as bighorn sheep, moose, elk and smaller mammals during the winter months by causing added stress. For example, snowmobiles may have contributed to declines in bighorn sheep in an area of Montana (Oliff et al. 1999) and may contribute to bighorn sheep not using the Milner Pass area of RMNP during the winter months when snowmobiles are in the area (Dave and Niki Stevens, personal communication).

Little information exists on the direct and indirect impacts of winter recreation on most wildlife species. However, these effects may create potentially cumulative or synergistic impacts to wildlife populations (Knight and Cole 1995). Effects would include energetic response to humans and human facilities, habituation to human activities, and attraction or conditioning to humans. The portion of Trail Ridge Road open year round in the Colorado River District has an impact on wildlife for those species that seek road habitat in search of food or use the road for travel.

During the past two winters several moose have approached parked automobiles to lick off the road salt. This habituated behavior has been observed numerous times and visitors come very close to the animals. In at least one instance, a moose placed its head inside the open window of a vehicle. It is unknown if visitors are feeding the moose, but it is highly suspected. When animals are in close proximity, there is a tendency for visitors to want to touch them or feed them. There have been documented cases of a moose damaging an automobile and charging a visitor. This places both visitors and wildlife in jeopardy (Jeff Connor, personal observation). In the past decade, park staff has had to kill or tranquilize and relocate mule deer, coyote, bighorn sheep, and black bear because of habituated behavior. If a moose places the safety of park visitors in jeopardy, it will have to be relocated or destroyed.

Implementing Alternatives 1 or 4 will eliminate any potential wildlife conflicts with snowmobiles along 16 mi. of Trail Ridge Road. However, automobiles will still be able to travel 10 mi. of Trail Ridge Road during the winter and potential wildlife conflicts will continue.

If Alternative 1 or 4 is implemented, Trail Ridge Road from the Timber Lake Trailhead parking lot to Milner Pass will be closed to automobiles and snowmobiles and will revert to a non-motorized backcountry trail during the winter. Doing so will allow wildlife to exist in a more natural setting. Bighorn sheep that may have been avoiding Milner Pass during the winter because of noisy snowmobiles may return if Alternative 1 or 4 is implemented (Dave Stevens, personal communication). The Milner Pass area has been identified as potential black bear den habitat and eliminating snowmobiles from the area will be a benefit to this species (Zeigenfuss, 2001).

Snowmobiles driving along the North Supply Access Trail will continue to impact wildlife, but this impact will be confined to a small portion of the park and is considered to be a minor impact to wildlife. Since most of the trail passes through lodgepole pine with little wildlife value, impacts will be minimal. Also, the area around the North Supply Access Trail is considered to be a developed area with NPS facilities, residences, utility corridors and roads. Some wildlife avoid this area throughout the year. Impacts to wildlife from snowmobiles in the Colorado River District will shift from a moderate impact to a minor impact if Alternative 1 is implemented.

Backcountry skiing or snowshoeing will continue to affect wildlife, and long-term cumulative impacts may occur if visitation continues to increase. Skiers and snowshoers are encouraged to stay on designated trails, but dispersed snowshoeing and skiing is allowed. Impacts to wildlife are more predictable along designated trails and wildlife have a better chance to adjust to this type of disturbance. Dispersed recreation is more unpredictable and can cause more impacts. Monitoring is necessary to determine if this use is causing any impacts.

A new Backcountry Management/Wilderness Plan has been approved that addresses all forms of recreation in about 95% of the park. The potential for wildlife conflicts is highest along the portion of Trail Ridge Road presently open to automobiles and snowmobiles and along the popular trail to Lulu City, which is used by skiers and snowshoers. Closing Trail Ridge Road to snowmobiles from the Timber Lake parking lot to Milner Pass may make the road more popular with skiers and snowshoers and may lead to some as yet unidentified cumulative long-term impacts that may have to be addressed at a later date. Presently it is unknown what impacts winter recreation, including those skiers and visitors who snowshoe, have on wildlife. The superintendent does have the discretion to protect sensitive wildlife by closing an area when deemed necessary. For example, closing a cliff to protect nesting raptors.

4.1.6 Impact on Wilderness Users

The impact of human recreation activities on wilderness is well studied. Regulations that maintain the wilderness quality of an area, such as management of access, will help minimize possible impacts on wilderness. Odors from snowmobile exhaust and noise from snowmobiles have an impact on users of recommended wilderness in RMNP. Snowmobiles can be noisy, and the sound carries well in Kawuneeche Valley and the surrounding area during the winter. At times, because of temperature inversions and no wind, odors will

linger in the area of the trail, which may have an impact on non-snowmobile users. However, Congress has stated that activities, sights and sounds that occur outside wilderness boundaries do not affect an area's wilderness suitability (A. Durand Jones, personal communication). For example, snowmobile use was well established, and noise and other impacts were occurring when Congress established the USFS Never Summer Wilderness in 1980. This wilderness area is located adjacent to RMNP, and winter visitors to this area continue to hear the sound of snowmobiles from nearby USFS land and from RMNP.

However, as stated in the park's recently approved Backcountry/Wilderness Management Plan and Environmental Assessment that went through extensive public review: "The NPS strives to preserve the natural quiet, the natural sounds, and the natural light associated with the physical and biological resources of the park. Activities causing excessive or unnecessary unnatural sound in and adjacent to parks are monitored, and actions are taken to prevent or minimize unnatural sounds that adversely affect park resource or values or visitors' enjoyment of them." This quote is also from NPS-77, Natural Resources Guidelines (2000). The 1976 Master Plan for RMNP recognizes humans, where present, as part of the park ecosystem, but the major emphasis is on the perpetuation of natural processes. If unacceptable impacts occur to park resources (i.e. excessive human caused noise) from recreational activities whether or not it is in the park's backcountry/wilderness, the park will make every effort possible to correct the problem. Snowmobiles noise will not effect the park's wilderness suitability, but does have a negative impact on visitors seeking tranquility. Snowmobiles have a larger impact on the natural soundscape and on solitude well into backcountry/wilderness, more so than automobiles or other forms of recreation and therefore warrant some mitigation to minimize those impacts. Closing Trail Ridge Road to snowmobiles eliminates snowmobile noise impacts 16 miles into the interior of the park and will benefit recommended and designated wilderness. Implementing Alternative 1 strikes a balance between preservation and protection and providing for the freest use of RMNP for recreation purposes. All recreation users will benefit from Alternative 1.

In the winter, vehicles can no longer travel on that portion of Trail Ridge Road that extends from Milner Pass on the west side of the Continental Divide to Many Parks Curve on the east side of the Continental Divide. That section of road then becomes a backcountry trail. The implementation of Alternative 1 or 4 will allow an additional 6 mi. (9.6 km) of Trail Ridge Road from the Timber Lake parking lot to Milner Pass to revert to a backcountry trail experience.

An automobile is not as noisy as a snowmobile and the implementation of Alternative 1 or 4 will enhance natural quiet and visitor's opportunities for a more natural wilderness experience. The experience of users of recommended wilderness in the Kawuneeche Valley in the vicinity of Trail Ridge Road would be protected and enhanced if Alternative 1 or 4 is adopted.

Alternative 2 or 3 if adopted, will have a cumulative negative impact and degrade the experience of users of recommended wilderness in the Kawuneeche Valley and up to Milner Pass as snowmobile use on Trail Ridge Road continues and would probably increase.

Alternative 3 further degrades the experience of users of recommended wilderness in the Kawuneeche Valley in the vicinity of Trail Ridge Road. Snowmobiles would be allowed to motor to the boundary of the USFS Never Summer Wilderness and some illegal entry into USFS wilderness and NPS recommended wilderness is possible if the Bowen Gulch Access Route is reopened. Snowmobile use on the Summerland Park Snowmobile Trail would further impact users of recommended wilderness. One of the reasons it was closed to snowmobiles in 1997 was because of illegal off-road travel into recommended wilderness.

The North Supply Access Trail is adjacent to recommended wilderness when it follows the Sun Valley Road. Snowmobile use along the North Supply Access Trail will continue to result in impacts to users of recommended wilderness in the southwest corner of the park.

Snowmobiles will still be heard from some park recommended wilderness areas regardless of which alternative is selected because of snowmobile travel on trails in the USFS Stillwater Trail OHV System. However, Alternative 1 and 4 minimizes or eliminates snowmobile noise 16 miles into the interior of the park. Limiting snowmobiles to the North Supply Access Trail will keep snowmobiles confined to a small portion of recommended wilderness in the park.

Noise from snowplows will still be heard in recommended wilderness along 10 mi. (16 km) of Trail Ridge Road. By maintaining the road with packed snow, noise impacts will be less as compared to plowing the road to pavement.

4.1.7 Impact on Air Quality

The Clean Air Act amendment of 1977 recognizes the need to protect visibility and air quality in national parks. RMNP is a mandatory Class I area. 87% of 4,000 park visitors surveyed (Valdez 1996) rated clean air extremely important to their park experience.

The two-stroke engines that power snowmobiles emit substantial amounts of air pollutants (Hagemann and VanMouwerik 1999) as follows:

1. Up to one-third of the fuel delivered to the engine goes straight through and out the tailpipe without being burned.
2. Two-stroke engines do not use a crankcase containing lubricating oil as is the case with most four-stroke engines. Lubricating oil is mixed directly with the fuel, and thus passes through the combustion chamber and is expelled as part of the exhaust.
3. Combustion in a two-stroke engine results in high emissions of air pollutants as well as several toxic pollutants, such as benzene and aromatic hydrocarbons, that the EPA classifies as known or probable human carcinogens.

Snowmobiles are used during the winter when meteorological conditions exacerbate the adverse environmental effects. Cold, stable atmospheric conditions with low wind speeds often lead to the concentration of carbon monoxide. Carbon monoxide can be present at high levels, especially at park entrance stations where snowmobile riders stop to pay their entrance fees. Concentrations of carbon monoxide can jeopardize the health and safety of park employees in heavily-use parks like Yellowstone (Fussell 1997). In

RMNP, there are no impacts to employees manning the Grand Lake Entrance, since it is not staffed from November 15 until May 1, which is the time period when snowmobiles are in use.

Moderate amounts of micropollutants in wetlands, ponds or lakes can be attributed to snowmobile use on nearby roadways or trails (Gjessing et al. 1984). Some pollutants travel as dust via the atmosphere in considerable concentrations, appearing on snow and ice during the winter.

Alternative 1 confines snowmobiles to a small corner of the park, and eliminates the use of snowmobiles on Trail Ridge Road. Air quality, odor and visibility impacts will continue to occur along the North Supply Access Trail. Alternative 1 will result in improvements to air quality along 16 miles of Trail Ridge Road especially above the Timber Lake Trailhead parking lot to Milner Pass where the six miles of road will be closed to all motorized vehicles during the winter months. More than 99% of RMNP will be protected from snowmobile pollutants. There will be an overall benefit to air quality in the Colorado River District in RMNP when snowmobiles are banned from Trail Ridge Road.

Alternative 2 will result in no change to air quality in RMNP as compared to current conditions. If snowmobile use increases in the future, there could be a long-term cumulative moderate to major impact 16 miles into the interior of the park.

Alternative 3 will result in a higher cumulative degradation of air quality in RMNP because it permits more extensive use of snowmobiles use as compared to Alternative 2. Cumulative long-term air quality, odor and visibility impacts would be considered a major adverse impact if Alternative 3 was implemented.

Because Alternative 4 eliminates public use of snowmobiles within RMNP, it will result in improved air quality within the park.

The Kawuneeche Valley will still experience some air quality impacts (haze) from automobiles and snowplows extending from the park boundary to the Timber Lake Trailhead parking lot. Maintaining the snowpacked road will have less of an impact on air quality than if the road was plowed to pavement. Plowing the road to pavement would require the use of traction sand and Ice Ban®, or a comparable product. Traction sand can degrade air quality due to the generation of particulates that can remain suspended in the air. Second, plowing the road to pavement requires additional snowplow operating time, which will result in more exhaust emissions. Maintaining a snowpacked road can reduce these air quality impacts.

4.2 IMPACT ON SOCIOECONOMIC RESOURCES AND VISITORS

4.2.1 Socioeconomic Resources

RMNP as a tourist attraction provides very important economic benefits to Colorado, particularly in the gateway communities of Grand Lake and Estes Park. There is general

agreement between the NPS and the businesses in Grand Lake that if Alternative 1 is implemented that some visitors who want to rent a snowmobile and drive on Trail Ridge Road will no longer do so. A private contractor, Research Triangle Institute (RTI) completed an economic impact analysis of the preferred alternative in a November 2000 report. It is anticipated that some visitors who may have rented a snowmobile and driven on Trail Ridge Road will do other activities in the Park and Grand Lake area, and others may not visit and would go elsewhere. An average of 4,690 snowmobiles used Trail Ridge Road in the winters of 1996-1997, 1997-1998, and 1998-1999. There was an average of 1.45 visitors per snowmobile for an average total of 6,800 visitors. RTI assumed in their report that 90% of snowmobile users that drive on Trail Ridge Road rent snowmobiles. Even though the true economic impact from the preferred alternative is presently unknown, RTI analyzed what the economic impact would be if 100%, 80% or 40% of the 6,800 visitors did not rent or use a snowmobile, 15% remained in the area, and the remainder decided to not visit Grand Lake or RMNP. Under those three scenarios 85%, 65% or 25% of the 6,800 visitors would not visit Grand Lake. The loss in business revenues is estimated to be \$624,300, \$491,800 or \$226,900 respectively. It is estimated that snowmobile rentals, sales, parts and services accounted for about \$2.3 million in gross income in the winter of 1999-2000. Lodging, retail sales and restaurants were equal to about \$2.7 million revenue in Grand Lake during the winter of 1999-2000. A loss of \$624,300, \$491,800 or \$226,900 would represent a 12%, 10% or 5% loss in business revenue. Depending on which scenario is accurate, there will be a minor to moderate economic impact to business revenue in Grand Lake from less visitors renting snowmobiles and not staying in Grand Lake.

Implementing Alternative 1 would not have a significant negative adverse impact on the local economy of the town of Grand Lake or Grand County. Banning snowmobiles in RMNP as discussed in Alternative 4 and eliminating the access through the park to the Stillwater Trail OHV System would have a potentially significant seasonal negative economic impact on the adjacent gateway community of Grand Lake, which claims to be the "Snowmobile Capital of Colorado." A recent article in *USA Today* ranked the Grand Lake area as one of the 10 best places to snowmobile in the United States. As previously mentioned, the North Supply Access Trail through RMNP is presently the only reasonable and safe access to the USFS trails particularly for visitors that rent snowmobiles.

One of the most important elements of the management of RMNP since its establishment in 1915 is the preservation and protection of natural and cultural resources. Settlement of what is now RMNP in the 1800s had a negative impact on natural resources and prehistoric cultural resources attributed to Native Americans. The settlement era inside the park is over and many of the disturbances have been removed and the areas restored. However, RMNP is one of the most popular tourist attractions in Colorado, with visitation exceeding 3 million people every year. The current trend indicates an approximate 2 percent increase in visitation per year into the foreseeable future with almost 4.9 million visitors expected annually by 2020. Visitors and the amenities they require have impacted natural and cultural resources. There were approximately 29,000 winter visitors to the Colorado River District via Trail Ridge Road in 1999/2000. Less than 15% of these visitors

used a snowmobile to travel on Trail Ridge Road. These numbers exclude visitors that only passed through the park by snowmobile along the North Supply Access Trail.

Presently, of all the snowmobiles that enter the park, about 85% just pass through 2 mi. (3.2 km) of the park along the North Supply Access Trail. There would be no change in rental times or fees for local businesses if Alternative 1 is selected. People renting snowmobiles would not have to trailer snowmobiles to the Idleglen parking lot or be required to travel on the hazardous Shadow Mountain Lake. Alternative 1 will not exacerbate the parking problem at the Idleglen parking lot.

RMNP keeps 80% of all money collected at entrance stations as part of the Fee Demonstration Program. The Colorado River District does not staff their entrance stations during the winter months when snowmobiles are in use, but the park does charge each snowmobile \$5.00 to enter the park. Fees are collected on the honor system. This fee is only charged for vehicles entering the park on Trail Ridge Road. Automobiles are charged \$15.00 to enter the park. Snowmobiles are not charged a fee for driving along the North Supply Access Trail because the trail only passes through a small portion of the park and snowmobile users driving along the North Supply Access Trail are not considered to be visiting the park. If Alternative 1 is adopted and Trail Ridge Road is closed to snowmobiles, the park could lose an estimated \$8,600 to \$10,320 per year based on an average of 4,300 snowmobiles entering the park per winter and the park collecting fees from 50 to 60% of the visitors. RMNP considers this loss in revenue to be a minor impact.

If Alternative 2 is implemented there will be no short-term change in the current use of the park by snowmobiles and no negative economic impact is anticipated. Rental times and fees would remain the same. Implementation of Alternative 2 would keep some visitors who do not use snowmobiles and who desire a more tranquil setting from using Trail Ridge Road in the winter. Impacts to visitors that find snowmobiles intrusive could increase in the long-term if the use of snowmobiles increase.

If Alternative 3 is implemented there will be a change in the current use of the park by snowmobiles. Snowmobiles will have access to two trails that were previously closed to snowmobile use. Because this alternative would provide expanded opportunities for snowmobile use, it is anticipated that it would provide a slight economic benefit to Grand Lake. Rental times and fees are expected to remain the same. Implementation of Alternative 3 could keep some visitors who do not use snowmobiles and who desire a more tranquil setting from using Trail Ridge Road, Summerland Park, and the Bowen Gulch/Never Summer Wilderness during the winter. Impacts to visitors that find snowmobiles intrusive could increase in the long-term if the use of snowmobiles increases.

Alternative 4 will have a significant adverse economic impact on the gateway community of Grand Lake. At the present time, snowmobilers can leave directly from rental companies in Grand Lake and can access the Stillwater Trail OHV System by crossing through a small portion of the park on the North Supply Access Trail. Only one rental company has direct access to USFS land without crossing through the park. For those businesses that rent snowmobiles rely on the North Supply Access Trail, there is presently no other access to the

Stillwater Trail OHV System on a direct route from Grand Lake. Closing the trail would directly or indirectly impact 10 businesses and 49 winter jobs that are related to snowmobile rental, sales and service (Ryan Monello, survey of businesses in the Grand Lake area). In addition, lodging and food establishments would also be impacted from the closing of the access trail.

If the North Supply Access Trail is closed, snowmobile users would need to trailer snowmobiles 6 mi. (9.6 km) to the Idleglen parking lot or travel over the ice on Shadow Mountain Lake. Owners of snowmobile related businesses in Grand Lake believe that all but one snowmobile rental business would go out of business if Alternative 4 were implemented. The only way this could be avoided is if the Idleglen parking area was expanded to accommodate more snowmobile trailers/automobiles, or the USFS were to allow guiding services, or an alternative route to the Stillwater Trail OHV System could be found without entering the park.

Currently, rental companies cannot trailer snowmobiles to the Idleglen parking lot because this constitutes a guide service, which is not permitted on USFS land and is not allowed in RMNP. Even if the USFS were to consider allowing guide services, it is not likely that a decision could be made in time to prevent some rental companies from going out of business. Most businesses could not be sustained with greatly curtailed snowmobile rentals.

If Alternative 4 is implemented, and no alternative route to the Stillwater OHV system is found, the only option for rental customers would be to rent a trailer and transport the snowmobile with their own vehicle. One business in Grand Lake estimated that 60-70% of people who currently rent snowmobiles in Grand Lake do not have a trailer hitch on their vehicle and could not trailer a snowmobile to the Idleglen parking area (which only handles approximately 30 automobiles).

On average, snowmobile users would need to rent snowmobiles for one additional hour in order to complete the round trip to and from the Idleglen parking lot. The most popular rental time is four hours, so a four-hour trip would be extended at least to five hours.

All but one snowmobile rental business would need to purchase trailers for customer use. A snowmobile trailer costs about \$1,200. Depending on the size of the rental business, anywhere from 5 to 20 trailers would have to be purchased. Rental companies would have to adjust their rental fees to cover the added cost of the trailers. The increase cost would be a negative impact to visitors who rent snowmobiles. One rental business is located on the edge of USFS land and has access to the Stillwater Trail OHV System without entering the park. This business would experience an economic benefit as other businesses experienced a negative economic impact if Alternative 4 was selected. Two businesses in Grand Lake depend on sales and service of snowmobiles and snowmobile products as their primary source of income. These businesses would be impacted if the North Supply Access Trail was closed and snowmobile rentals, sales or service dropped as a result.

The Idleglen parking lot can only accommodate about 30 vehicles and cannot support a significant increase in rental traffic. The USFS may expand the parking lot in three to five

years, but in their planning they did not consider that the park would be closed to snowmobiles and that the Idleglen parking lot would experience increased use as a result. Besides benefiting snowmobile users, expanding the parking lot may be a benefit to Nordic skiers and people who snowshoe. However, some Nordic skiers and people who snowshoe would have a negative experience because of the increase in snowmobiles and may avoid the Idleglen parking lot.

4.2.2 Visitor Use

RMNP's preferred alternative is to restrict snowmobile use to the North Supply Access Trail and permanently close Trail Ridge Road, the Summerland Park Snowmobile Trail, and the Bowen Gulch Access Route. On average, 15% of the snowmobiles entering the park use Trail Ridge Road and 85% use the North Supply Access Trail. The Summerland Park Snowmobile Trail and Bowen Gulch Access Route are currently closed to snowmobiles. If Trail Ridge Road is closed to snowmobiles, there are still numerous snowmobile routes in the Grand Lake area and many opportunities still exist for snowmobile users. However, some visitors that wanted to visit RMNP by snowmobile by driving along Trail Ridge Road may not do so, and would go elsewhere. The experience of park visitors who choose to Nordic ski or snowshoe to access the park during the winter will be enhanced by the elimination of snowmobiles in Summerland Park, Bowen Gulch and along Trail Ridge Road in the Kawuneeche Valley and onto Milner Pass. This type of use may increase between the Timber Lake Trailhead and Milner Pass when snowmobiles no longer drive on Trail Ridge Road.

Implementing Alternative 1 would provide the opportunity for visitors to enjoy snowmobile recreational opportunities without having to trailer a snowmobile to a trailhead. The snowmobile recreational opportunities would just not occur to any significant extent on NPS administered land, but on USFS land outside the park. Alternative 1 is safer for snowmobile users than Alternative 4 because it makes travel on Shadow Mountain Lake to reach a trailhead unnecessary. With Alternative 1, the experience of park visitors who do not use snowmobiles will be enhanced because snowmobiles will no longer be permitted in the interior of the park.

There would be no change in snowmobile use in the short-term if Alternative 2 is implemented. The experience of park visitors who do not use snowmobiles will continue to be negatively impacted if Alternative 2 is adopted. Most park visitors surveyed (Valdez 1996) rated tranquility as extremely important.

Alternative 3 would provide more opportunities for snowmobile use in the park than Alternative 2. More park visitors who do not use snowmobiles will be negatively impacted if Alternative 3 is adopted.

The North Supply Access Trail is used almost exclusively by snowmobilers. The trail is rarely used during the winter for Nordic skiing or snowshoeing. This lack of use has more to do with the location of the trail along the park boundary and lack of non-snowmobile recreational opportunities than the trail being used by snowmobiles. If the trail was closed

to snowmobiles as discussed in Alternative 4, it will provide a new opportunity for Nordic skiers and snowshoers who may have avoided this trail because of snowmobile use. Even if the trail is closed to snowmobiles, it is doubtful that there will be a large increase in use by Nordic skiers and snowshoers.

Alternative 4 will enhance the park experience for visitors who do not use snowmobiles, but will deny snowmobile users who rent machines in Grand Lake the opportunity to access USFS trails outside the park without having to drive a snowmobile on Shadow Mountain Lake or having to use a trailer to transport a snowmobile to the Idleglen parking lot. As mentioned earlier, the North Supply Access Trail is a dirt road that is used by vehicles during other times of the year. Even if it is closed to snowmobiles, it will not revert back to natural conditions.

4.3 IMPACT ON CULTURAL RESOURCES

4.3.1 Impact on Historic Resources

There will be no known negative impact to any historic resources by the implementation of any of the alternatives.

4.3.2 Impact on Prehistoric Resources

There will be no known negative impact to any prehistoric resources by the implementation of any of the alternatives.

4.4 SUMMARY OF THE ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

Table 2 summarizes the environmental consequences of the preferred alternative and the three other alternatives.

Table 2. Environmental Consequences of the Alternatives

IMPACT TOPIC	Alternative 1— Preferred: Open to Snowmobiles - North Supply Access Trail CLOSED TO SNOWMOBILES - Trail Ridge Road - Summerland Park Snowmobile Trail - Bowen Gulch Access Route	Alternative 2 – No Action: Open to Snowmobiles - North Supply Access Trail - Trail Ridge Road from the Kawuneeche Visitor Center to Milner Pass Closed to Snowmobiles - Summer Park Snowmobile Trail - Bowen Gulch Access Route	Alternative 3— Least Restrictive: Open to Snowmobiles - North Supply Access Trail - Trail Ridge Road - Summerland Park Snowmobile Trail - Bowen Gulch Access Route Closed to Snowmobiles - Remainder of the park	Alternative 4— Most Restrictive: Open to Snowmobiles - None CLOSED TO SNOWMOBILES - Entire park
Soils & Vegetation	There will be no anticipated negative impact to soil and vegetation except along two miles of the access trail. Leaving Trail Ridge Road snowpacked will minimize the use of sand and Ice Ban®.	Same as Alt. 1 plus, there will continue to be some impacts to vegetation along Trail Ridge Road from illegal off-road travel and a possible long-term impact from snowmobile pollution in the Kawuneeche Valley and Milner Pass area.	There will be an increase in impacts to soil and vegetation along Trail Ridge Road, the Summerland Park Snowmobile Trail and Bowen Gulch Access Route from some illegal off-road travel and a possible long-term impact from snowmobile caused pollution.	There will be no anticipated negative impacts to soil and vegetation in the park from snowmobiles. Maintaining Trail Ridge Road as a snowpacked road will minimize the use of sand and Ice Ban®.
Natural Sounds and Night Lighting	There will continue to be negative impacts to the natural soundscape in the vicinity of the North Supply Access Trail. Snowmobiles using the Stillwater Trail OHV System will still be heard in some park areas in the Kawuneeche Valley, but most of the valley will be free from snowmobile noise.	Same as Alt. 1 plus, there will continue to be impacts within the entire Kawuneeche Valley and beyond to Milner Pass.	There will be an increase in impacts within the entire Kawuneeche Valley and beyond to Milner Pass, plus along the Summerland Park Access Trail, the Bowen Gulch Access Route, as well as in the Never Summer wilderness.	Noise impacts from public use of snowmobiles will be greatly reduced within RMNP. Snowmobiles using the Stillwater Trail OHV System will still be heard in some park areas.
Aquatic, Wetland and Riparian Communities	Given the available data, there are no anticipated long-term impacts to wetland and riparian communities.	The potential remains for snowmobiles to impact wetland and riparian communities.	There will be an increased impact to wetland and riparian communities	Same as Alternative 1.
Impacts on Threatened, Endangered, or Rare Species	No negative impact is expected on T&E or rare species.	Impacts to T&E and rare species, especially potential lynx habitat, could still occur in the Kawuneeche Valley and onto Milner Pass. RMNP would not meet the intention of its	There would be increased impacts to T&E and rare species in the Kawuneeche Valley and onto Milner Pass, as well as in the Summerland Park and Bowen gulch areas.	There may be an increase in impacts to bald eagles because more snowmobiles may drive on Shadow Mountain Lake, causing an increase in noise levels near the bald eagle

IMPACT TOPIC	Alternative 1— Preferred: Open to Snowmobiles - North Supply Access Trail CLOSED TO SNOWMOBILES - Trail Ridge Road - Summerland Park Snowmobile Trail - Bowen Gulch Access Route	Alternative 2 – No Action: Open to Snowmobiles - North Supply Access Trail - Trail Ridge Road from the Kawuneeche Visitor Center to Milner Pass Closed to Snowmobiles - Summer Park Snowmobile Trail - Bowen Gulch Access Route	Alternative 3— Least Restrictive: Open to Snowmobiles - North Supply Access Trail - Trail Ridge Road - Summerland Park Snowmobile Trail - Bowen Gulch Access Route Closed to Snowmobiles - Remainder of the park	Alternative 4— Most Restrictive: Open to Snowmobiles - None CLOSED TO SNOWMOBILES - Entire park
		Master Plan, NPS policies and guidelines or Executive Orders 11644 or 11989.	RMNP would not meet the intention of its Master Plan, NPS policies and guidelines or Executive Orders 11644 or 11989.	closed area. The potential will increase that some snowmobiles may illegally enter the closed area.
Wildlife	Long-term negative impacts are expected to be minor. The North Supply Access Trail passes through a developed area that is considered to have little wildlife value. Maintaining Trail Ridge Road as a snowpacked road will minimize the use of sand and Ice Ban® along Trail Ridge Road, minimizing impacts to wildlife.	Impacts to wildlife from snowmobiles are expected to be moderate along Trail Ridge Road in the Kawuneeche Valley south of the Timber Lake Trailhead parking lot. Impacts to wildlife are considered to be major north of the parking lot to Milner Pass since no other motorized vehicles are allowed in this area during the winter.	Same as Alternative 2, but with an increase in impacts to wildlife with the reopening of the Summerland Park Snowmobile Trail and Bowen Gulch Access Route. Impacts in the Bown Gulch and Summerland Park areas are expected to be major since no other motorized vehicles are allowed in these areas during the winter.	No long-term impacts from snowmobiles are expected.
Wilderness	The experience of wilderness users would be better protected. Localized impacts to users of recommended wilderness would occur along the North Supply Access Trail. Six mi. (9.6 km) of Trail Ridge Road above the Timber Lake parking lot would revert to a backcountry trail experience during the winter. Snowmobiles would continue to be heard in some park areas from the Stillwater Trail OHV System.	Wilderness designation does not prohibit snowmobile use outside of proposed or designated wilderness. However, the experience of wilderness users would not be as well protected for 16 mi. (25.6 km) into the interior of the park on both sides of Trail Ridge Road. Six mi. (9.6 km) of Trail Ridge Road above the Timber Lake parking lot would not revert to a backcountry trail experience.	Wilderness designation does not prohibit snowmobile use outside of proposed or designated wilderness. However, the experience of wilderness users would be compromised 16 mi. (25.6 km) into the interior of the park on both sides of Trail Ridge Road, in the Never Summer Wilderness near the park boundary, and in Summerland Park. Six mi. (9.6 km) of Trail Ridge Road above the	The experience of wilderness users would be protected throughout the entire park. However, snowmobiles will still be heard in some park areas as they drive on the Stillwater Trail OHV System.

IMPACT TOPIC	Alternative 1— Preferred: Open to Snowmobiles - North Supply Access Trail CLOSED TO SNOWMOBILES - Trail Ridge Road - Summerland Park Snowmobile Trail - Bowen Gulch Access Route	Alternative 2 – No Action: Open to Snowmobiles - North Supply Access Trail - Trail Ridge Road from the Kawuneeche Visitor Center to Milner Pass Closed to Snowmobiles - Summer Park Snowmobile Trail - Bowen Gulch Access Route	Alternative 3— Least Restrictive: Open to Snowmobiles - North Supply Access Trail - Trail Ridge Road - Summerland Park Snowmobile Trail - Bowen Gulch Access Route Closed to Snowmobiles - Remainder of the park	Alternative 4— Most Restrictive: Open to Snowmobiles - None CLOSED TO SNOWMOBILES - Entire park
		Snowmobiles would continue to be heard in some park areas from snowmobiles using Stillwater Trails.	Timber Lake parking lot would not revert to a backcountry trail experience.	
Air Quality	This alternative would better protect air quality, particularly haze impacts in the Kawuneeche Valley, but would have local negative impacts along the North Supply Access Trail. Visibility and odor impacts will continue to occur along the trail, but are considered to be minor when compared to Alternatives 2 and 3.	This alternative would have a continued negative impact on air quality in Kawuneeche Valley and beyond to Milner Pass, and along the North Supply Access Trail. Odor and visibility impacts are considered to be moderate when compared to the other Alternatives.	This alternative would increase negative impacts with the reopening of the Summerland Park Snowmobile Trail and Bowen Gulch Access Route. Odor and visibility impacts are considered to be major because the impacts are more widespread than Alternative 1 and 2.	This alternative would reduce air quality impacts to RMNP from snowmobiles.
Economic Impacts	There should be no significant negative economic impact to Grand Lake. The opportunity for an increase in long-term economic benefits will still exist.	Same as Alternative 1.	There is the potential for a slight economic benefit for Grand Lake because of expanded snowmobiling opportunities.	At a minimum, this alternative will have a short-term significant negative economic impact on the gateway community of Grand Lake.
Cultural Resources	There will be no impact to cultural resources.	Same as Alternative 1.	Same as Alternative 1.	Same as Alternative 1
Visitor Use	A wide spectrum of visitors would continue to receive access to prime natural, cultural, scenic and recreational resources.	Same as Alternative 1, except those who do not use snowmobiles will continue to be negatively impacted by snowmobiles traveling 16 mi. (25.6 km) into the interior of the park.	Same as Alternative 2, except there will be an increase in impacts to those who do not use snowmobiles because the Summerland Park Snowmobile Trail and the Bowen Gulch Access Route will be reopened to snowmobiles	Those who do not use snowmobiles will benefit from this alternative but snowmobile users will be negatively impacted.

Section 5. ADMINISTRATIVE ISSUES

Based on which alternative is implemented, the park will do the following:

1. If Alternative 1 is implemented the NPS would continue to use snowmobiles on the North Supply Access Trail for administrative purposes. However, NPS administrative use of snowmobiles on Trail Ridge Road and elsewhere in the park will be restricted to that required to manage public use, to conduct emergency operations, and to accomplish essential maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means.
2. Whenever possible, replacement snowmobiles that are purchased by RMNP will be selected on the basis of state-of-the-art emissions and noise control, which would presently be the purchase of snowmobiles with four-stroke engines versus two-stroke engines.
3. Natural Resources Conservation Service (NRCS) employees currently travel by snowmobile from the Timber Lake Trailhead to Lake Irene once a month during the winter to collect data from a Snotel station. This monitoring station provides snowpack and water content information that the NRCS uses to predict water flow in the North Fork of the Colorado River for downstream water users. If Alternative 1 or 4 is implemented, NRCS employees will not be able to use snowmobiles to travel to Lake Irene for normal data collection. Travel to the site must therefore be on snowshoes or skis. There is an occasional emergency repair of equipment, estimated to be once every five years that may need the use of a snowmobile. The equipment needed for emergency repair is heavy, would be arduous and pose a safety risk to NRCS personnel if they were denied the use of a snowmobile. The need for a snowmobile for emergency repair will be analyzed on a case by case basis. The NRCS will be required to notify the park of any emergency repair and if they request a snowmobile. A minimum requirement analysis as required in the Backcountry/Wilderness Management Plan will be completed and approved. There is a patrol cabin at Lake Irene that the NRCS could use if deemed necessary. However, the cabin is currently not habitable and would need to be upgraded before it can be used.
4. Monitoring natural resources, which include water, soil, air and noise sampling for contaminants, will be done as required by Executive Orders 11644 and 11989. The extent of monitoring will depend on which alternative is implemented as follows:
 - a. If Alternative 1 is selected, monitoring will be conducted along the North Supply Access Trail, including the nearby pond and the North Fork of the Colorado River. Since this alternative would not be implemented until 2002-2003, monitoring would commence at that time.
 - b. If Alternative 2 is selected monitoring will be conducted as proposed for Alternative 1, and would be expanded to include the Kawuneeche Valley in the vicinity of Trail Ridge Road and onto Milner Pass.

- c. If Alternative 3 is selected monitoring will be conducted as proposed for Alternative 2, and would be expanded to include the Bowen Gulch and Summerland Park areas.
 - d. If Alternative 4 is selected, monitoring for snowmobile impacts will not be needed.
- 5. Once a better data set is acquired, it will be used to determine if adverse impacts to natural resources are occurring because of snowmobile use in the park. If the data shows significant adverse impacts, snowmobile use in the park will be reevaluated.
 - 6. If Alternative 4 is implemented, snowmobile travel on Shadow Mountain Lake is expected to increase that may impact the bald eagle closure below Shadow Mountain Lake dam. Additional law enforcement presence will be needed to protect the bald eagle closure.

Section 6. SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY AND CUMULATIVE IMPACTS FROM THE ALTERNATIVES

The preferred alternative will enhance the long-term productivity of the natural resources within RMNP and not have a significant adverse negative affect on the economy of Grand Lake. It also minimizes impacts to the Arapaho National Forest. It will have a continued negative localized impact on some natural resources along the North Supply Access Trail, but this impact is considered to be minor to moderate. Greater than 99% of the park will be protected from snowmobiles. The preferred alternative will benefit the Kawuneeche Valley and Milner Pass area by removing snowmobiles from the interior of the park. The preferred alternative may also help ensure that species such as the lynx and wolverine will survive if a viable population is ever reestablished. In the long-term, the park's natural resources will benefit from the implementation of Alternative 1 and snowmobile use should have no significant cumulative irretrievable and irreversible impact on the park. It is anticipated that some of the 15% of snowmobiles that travel on Trail Ridge Road would shift to the North Supply Access Trail. This would result in an increase in snowmobiles along the North Supply Access Trail. This increase in snowmobiles along the North Supply Access Trail is not expected to compromise public safety or natural resources.

Alternatives 2 and 3 will not benefit the long-term productivity of the natural resources, but has a higher risk of irretrievable and irreversible impacts on the unique natural resources in the Kawuneeche Valley and Milner Pass areas. Alternative 3 will impact natural resources in the Summerland Park and Bowen Gulch areas. The potential exists for an increase in snowmobile activity in the interior of the park. Alternatives 2 or 3 will not have a negative impact on the economy of Grand Lake.

Alternative 4 will benefit the natural and cultural resources of the park, but will have a short-term and possible long-term significant adverse negative impact on the economy of Grand Lake if the town is not able to find an alternative means of accessing the Stillwater Trail OHV System. Eliminating snowmobiles from the park will not cause a significant shift in

snowmobile use from RMNP to USFS land since 85% of the snowmobiles entering the park are already accessing the USFS Stillwater Trail OHV System via the North Supply Access Trail. Alternative 4 would have a negative impact on the Arapaho National Forest particularly along County Road 4 and the Idleglen parking area because of inadequate parking.

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APPENDIX I

ENDANGERED, THREATENED, AND RARE SPECIES

ROCKY MOUNTAIN NATIONAL PARK

Revised March 2000

Rocky Mountain National Park uses the following sources to identify endangered, threatened and rare species that must be protected if found within the proposed project site.

Agencies have a variety of ways of tracking and measuring the biological imperilment of species. The U.S. Fish and Wildlife Service (USFWS) determines if a given species needs protection under the Endangered Species Act. There are three primary categories to federal listing:

Federal Status Codes

- LE Federal Endangered** – Listed as endangered by the U.S. Fish and Wildlife Service. The species is in danger of extinction throughout all or a significant portion of its range. Endangered species have legal protection under federal law.
- LT Federal Threatened** – Listed as threatened by the U.S. Fish and Wildlife Service. The species is likely to become endangered within the foreseeable future. Threatened species have legal protection under federal law.
- C Federal Candidate** – The U.S. Fish and Wildlife Service is considering federal listing.

The Colorado Division of Wildlife also maintains a list of imperiled species for the state of Colorado. There are three primary categories to state listing:

State Status Codes

- E State Endangered** – Listed as endangered by the Colorado Division of Wildlife. The species is in danger of extirpation throughout all or a significant portion of its range within the state of Colorado. State endangered species have legal protection under Colorado Revised Statutes 33-2-105 Article 2.
- T State Threatened** – Listed as threatened by the Colorado Division of Wildlife. The species is likely to become endangered within the state of Colorado within the foreseeable future. State threatened species have legal protection under Colorado Revised Statutes 33-2-105 Article 2.
- SC State Special Concern** – Listed as species of concern by the Colorado Division of Wildlife.

The Colorado Natural Heritage Program (CNHP), based in Fort Collins manages a large database and ranking system for Colorado species. Their ranking system has two primary components – a ranking for the global status of the species (G), and a ranking for that part

of the range found within the state (S). Numeric extensions are added to these on a scale of 1 (extremely rare) to 5 (common).

Natural Heritage ranks should not be interpreted as legal designations. Although most species protected under state or federal endangered species laws are extremely rare, not all rare species receive legal protection.

Global Rank Codes

- G1** Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extinction.
- G2** Imperiled globally because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extinction throughout its range.
- G3** Vulnerable throughout its range or found locally in a restricted range (21 to 100 occurrences).
- G4** Apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery.
- G5** Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.
- ?** Uncertainty about an assigned global rank.
- T#** Trinomial rank used for subspecies or varieties. These species are ranked on the same criteria as G1-G5.

State Rank Codes

- S1** Critically imperiled in state because of extreme rarity (5 or fewer occurrences, or very few remaining individuals), or because of some factor of its biology making it especially vulnerable to extirpation from the state.
- S2** Imperiled in state because of rarity (6 to 20 occurrences), or because of other factors demonstrably making it very vulnerable to extirpation from the state.
- S3** Vulnerable in the state (21 to 100 occurrences).
- S#B** Refers to the breeding season imperilment of species that are not permanent residents.
- S#N** Refers to the non-breeding season imperilment of species that are not permanent residents.
- SX** Presumed extirpated from the state.
- ?** Indicates uncertainty about an assigned state rank.

The Rocky Mountain National Park list of Endangered, Threatened, and Rare Species does not include State Ranks Codes S4 and S5 because these rankings indicate that the species is secure throughout its range.

Scientific Name	Common Name	Status		CNHP Rank	
		Federal	State	Global	State
Amphibians					
<i>Bufo Boreas Popl</i>	Boreal Toad	C	E	T1	S1
<i>Rana Pipiens</i>	Northern Leopard Frog		SC	G5	S3
<i>Rana Sylvatica</i>	Wood Frog			G5	S3
Birds					
<i>Accipiter Gentilis</i>	Northern Goshawk			G5	S3B
<i>Aegolius Funereus</i>	Boreal Owl			G5	S2
<i>Amphispiza Belli</i>	Sage Sparrow			G5	S3B
<i>Ardea Herodias</i>	Great Blue Heron			G5	S3B
<i>Bucephala Albeola</i>	Bufflehead			G5	S1B
<i>Bucephala Islandica</i>	Barrow's Goldeneye		SC	G5	S2B
<i>Circus Cyaneus</i>	Northern Harrier			G5	S3B
<i>Cypseloides Niger</i>	Black Swift			G4	S3B
<i>Dendroica Pennsylvanica</i>	Chestnut-Sided Warbler			G5	S2B
<i>Falco Peregrinus Anatum</i>	American Peregrine Falcon		SC	T4	S2B
<i>Grus Canadensis Tabida</i>	Greater Sandhill Crane		T	T4	S2B, S4N
<i>Haliaeetus Leucocephalus</i>	Bald Eagle	LT	T	G4	S1B, S3N
<i>Melanerpes Erythrocephalus</i>	Red-Headed Woodpecker			G5	S3B
<i>Pandion Haliaeetus</i>	Osprey			G5	S3B
<i>Setophaga Ruticilla</i>	American Redstart			G5	S1B
<i>Vireo Olivaceus</i>	Red-Eyed Vireo			G5	S3B
Fish					
<i>Catostomus Platyrhynchus</i>	Mountain Sucker		SC	G5	S2?
<i>Oncorhynchus Clarki Pleuriticus</i>	Colorado River Cutthroat		SC	T3	S3
<i>Oncorhynchus Clarki Stomias</i>	Greenback Cutthroat	LT	T	T2T3	S2S3

Scientific Name	Common Name	Status		CNHP Rank	
		Federal	State	Global	State
Mammals					
<i>Canis Lupis</i>	Gray Wolf	LE	E	G4	SX
<i>Felis Lynx Canadensis</i>	Lynx	LT	E	G5	S1
<i>Gulo Gulo</i>	Wolverine	C	E	G4	S1
<i>Lutra Canadensis*</i>	Northern River Otter*		E	G5	S3S4
<i>Sorex Hoyimontanus</i>	Pygmy Shrew			T2T3	S2
<i>Sorex Nanus</i>	Dwarf Shrew			G4	S2S3
<i>Ursus Arctos</i>	Grizzly or Brown Bear	LT	E	G4	SX
Invertebrates (Insects)					
<i>Colorado Luski</i>	A Buckmoth			G?	S1?
<i>Erebia Theano Ethela</i>	Edward's Alpine			G4	S3
<i>Hyles Galli</i>	Galium Sphinx Moth			G?	S3?
<i>Oarisma Edwardsii</i>	Edwards's Skipperling			G4	S3
<i>Oeneis Polixenes</i>	Polixenes Arctic			G5	S3
<i>Pachysphinx Modesta</i>	Modest Sphinx Moth			G?	S3?
<i>Paratrytone Snowi</i>	Snow's Skipper			G4	S3
<i>Pyrgus Ruralis</i>	Two-Banded Skipper			G4	S3
<i>Pyrgus Xanthus</i>	Xanthus Skipper			G3G4	S3
<i>Speyeria Cybele Cybele</i>	Great Spangled Fritillary			T5	S1
<i>Speyeria Hydaspe</i>	Hydaspe Fritillary			G5	S2
<i>Speyeria Nokomis Nokomis</i>	Great Basin Silverspot Butterfly			T2	S1
Mollusk					
<i>Acroloxus Coloradensis</i>	Rocky Mountain Capshell		SC	G?	S2

Scientific Name	Common Name	Status		CNHP Rank	
		Federal	State	Global	State
Plants					
<i>Aletes Humilis</i>	Larimer Aletes			G2G3	S2S3
<i>Aquilegia Saximontana</i>	Rocky Mountain Columbine			G3	S3
<i>Botrychium Echo</i>	Reflected Moonwort			G2	S2
<i>Bortychium Lanceolatum</i> var <i>Lanceolatum</i>	Lance-Leaved Moonwort			T4	S2
<i>Bortychium Lunaria</i>	Moonwort			G5	S2
<i>Bortychium Minganense</i>	Mingan Moonwort			G4	S1
<i>Bortychium Pallidum</i>	Pale Moonwort			G2	S2
<i>Carex Leptalea</i>	Bristle-Stalk Sedge			G5	S1
<i>Cyripedium Fasciculatum</i>	Purple's Lady's-Slipper			G4	S3
<i>Cystopteris Montana</i>	Mountain Bladder Fern			G5	S1
<i>Draba Grayana</i>	Gray's Peak Whitlow-Grass			G2	S2
<i>Drymaria Effusa</i> var. <i>Depressa</i>	Pinewoods Drymary			T4	S1
<i>Dryopteris Expansa</i>	Spreading Wood Fern			G5	S1
<i>Juncus Tweedyi</i>	Tweedy Rush			G3	S1
<i>Juncus Vaseyi</i>	Vasey Rush			G5?	S1
<i>Liatris Ligulistylis</i>	Gay-Feather			G5?	S1S2
<i>Lilium Philadelphicum</i>	Wood Lily			G5	S3
<i>Listera Borealis</i>	Northern Twayblade			G4	S2
<i>Listera Convallarioides</i>	Broad-Leaved Twayblade			G5	S2
<i>Mimulus Gemmiparus</i>	Weber Monkey Flower			G2	S2
<i>Papaver Khuanense Occidentale</i>	Alpine Poppy			T5	S2
<i>Parnassia Kotzebuei</i>	Kotzebue Grass-of-Parnassus			G4	S2

Scientific Name	Common Name	Status		CNHP Rank	
		Federal	State	Global	State
<i>Penstemon cyathophorus</i>	Middle Park Penstemon			G3G4	S3
<i>Potentilla Effusa</i> Var. <i>Rupicola</i>	Rocky Mountain Cinquefoil			T2	S2
<i>Salix Serissima</i>	Autumn Willow			G4	S1
<i>Sisyrinchium Pallidum</i>	Pale Blue-Eyed Grass			G3	S2
<i>Viola Selkirkii</i>	Selkirk Violet			G5?	S1

APPENDIX II

List of sources used by Rocky Mountain National Park to identify endangered, threatened and rare species that must be protected if found within the proposed project site.

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Yeatts, L. 1990. Botanical Survey of Rocky Mountain National Park. The Denver Botanic Gardens. Denver, Co. 41pp.

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APPENDIX III



MATERIAL SAFETY DATA SHEET

SECTION I: MATERIAL IDENTIFICATION

Trade Name: **Ice Ban[®] M50**
Manufacturer: *EnviroTech Services, Inc.*
Address: *PO Box 338*
Kersey, CO 80644
Telephone: *(970) 352-8845*
Fax: *(970) 352-0620*
Date Prepared: *September 28, 1997*

SECTION II: HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components: *None*
OSHA Pel: *None*
ACGIH TLV: *None*
Other Limit: *None*

SECTION III: PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point: *100°C*
Vapor Pressure: *NA*
Vapor Density: *NA*
Solubility in Water: *100%*
Specific Gravity: *1.25-1.29*
Melting Point: *NA*
Volatile: *0%*
Evaporation Rate: *1*
PH: *2.5-4.5*
Appearance and Odor: *Thick brown liquid, pleasant odor.*

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

Flash Point: *Nonflammable*
Flammable Limits: *None* LEL: *NA* UEL: *NA*
Extinguishing Media: *Nonflammable*
Special Fire Fighting Procedures: *None.*
Unusual Fire and Explosion Hazards: *None*

SECTION V: REACTIVITY DATA

Stability: *Stable*
Incompatibility: *None Known*
Hazardous Decomposition or Byproducts: *None*.
Hazardous Polymerization: *Will Not Occur*
Conditions to Avoid: *None*

SECTION VI: HEALTH HAZARD DATA

Routes of Entry: *Ingestion.*
Health Hazard: *None Known*
Carcinogenicity: NTP? *No* ARC Monographs? *No* OSHA Regulated?
No
Signs & Symptoms of Exposure:
Medical conditions Generally Aggravated by Exposure: *None Known*
Emergency and First Aid Procedures:
Eye Contamination—Wash eyes thoroughly with plenty of water.
Skin—Wash thoroughly with warm water.
Ingestion—Give fluids and treat symptomatically.

SECTION VII: PRECAUTION FOR SAFE HANDLING AND USE

If Released or Spilled: *Small amounts, flush to drain. Large amounts mix with road sand.*
Waste Disposal Method: *NA.*
Precautions to be Taken in Handling and Storage: *None*
Other Precautions: *None*

SECTION VIII: CONTROL MEASURES

Respiratory Protection: *Not Required. NIOSH approved mask.*
Ventilation: *Not Required.*
Protective Devices: *Not Required.*
Work/Hygienic Practices: *No special practices.*

Disclaimer: *EnviroTech Services, Inc. believes that the information contained in this MSDS sheet to be accurate; however, the data and information are presented without any representation of warranty, expressed or implied, regarding the accuracy or correctness. Once this product leaves the property of EnviroTech Services, Inc., the conditions or methods of handling, storage, use and disposal are beyond the control and knowledge of EnviroTech Services, Inc. For this and other reasons, EnviroTech Services, Inc. does not assume responsibility and expressly disclaims any liability for loss, damage, injury or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.*